Audubon Nature Institute

G.U.L.F.

Gulf United for Lasting Fisheries

G.U.L.F. Sustainability Benchmarking Report based on A Checklist for Fisheries Resource Management Issues Seen From The Perspective of the FAO Code of Conduct for Responsible Fisheries ("Caddy Checklist", FAO Circular 917, 1996)

As applied to the Louisiana shrimp fishery brown shrimp (*Farfantepenaeus aztecus*) white shrimp (*Litopenaeus setiferus*) harvested in state and federal waters

Audubon Nature Institute

1/25/2016

The Caddy Checklist (John Caddy, FAO 1996), an operationalized version of the Food and Agriculture Organization's (FAO) Code of Conduct for Responsible Fisheries, was used to benchmark the Louisiana shrimp fishery against the clauses of the Checklist, drawing information from public documents, Louisiana Department of Wildlife and Fisheries (LDWF) and NOAA Fisheries data and reports, and interviews with LDWF staff, NOAA staff and Louisiana shrimp industry members. This Sustainability Benchmarking Report was authored by Audubon Nature Institute, and prepared by Laura Picariello, Research Manager of Gulf United for Lasting Fisheries program, at the request of LDWF.

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Key Terms and Acronyms

ACL- annual catch limits
ALF- annual landings form
AP- advisory panel
ASPA- American Shrimp Processors Association
BRD- bycatch reduction device
cELB – cellular electronic logbook
CAB- certification assessment body
CCRF- Code of Conduct for Responsible Fisheries
CONAPESCA- Mexico's National Commission of Aquaculture and Fishing
COOL- Country of Origin Labeling
DOC- Department of Commerce
DOI- Department of Interior
EEZ- Exclusive Economic Zone
ELB- electronic logbook program
EIS- Environmental Impact Statement
EA- Environmental Assessment
EPA- Environmental Protection Agency
ESA- Endangered Species Act
EFH – Essential Fish Habitat
FAO- Food & Agriculture Organization of the United Nations
FCT- fishery cooperation talks
FIN- Fisheries Information Network
FIS- fishery impact statement
FMP- fishery management plan
GMEI- Gulf of Mexico Estuarine Inventory and Study
GMFMC- Gulf of Mexico Fishery Management Council
GOM- Gulf of Mexico
GoMI- Gulf of Mexico Initiative
GSMFC- Gulf States Marine Fisheries Commission
GSS- Gulf Shrimp System
HACCP- Hazard Analysis and Critical Control Points
IJF- Interjurisdictional Fisheries Program
JEA- Joint Enforcement Agreement
LDWF- Louisiana Department of Wildlife & Fisheries
LEC- Law Enforcement Committee
LED- Law Enforcement Division
LDEQ - Louisiana Department of Environmental Quality
LDNR – Louisiana Department of Natural Resources
LFF-Louisiana Fisheries Forward Program
LSA- Louisiana Shrimp Association
LWFC- Louisiana Wildlife and Fisheries Commission
MFMT- maximum fishing mortality threshold
MMPA- Marine Mammal Protection Act
MOU- memorandum of understanding
MSA- Magnuson-Stevens Fishery Conservation and Management Act
MSST- minimum stock size threshold
MSY-maximum sustainable yield
NAO- NOAA Administrative Order
NFWF- National Fish and Wildlife Foundation
NOAA Fisheries - National Marine Fisheries Service
NMFS – National Marine Fisheries Service
NEPA- National Environmental Protection Act
NERR- National Estuarine Research Reserve
NGO- non-governmental organization
NIFA- National Institute of Food and Agriculture
NOAA- National Oceanic and Atmospheric Administration
NPS- National Park Service
NRCS- Natural Resources Conservation Service
NRDA- Natural Resource Damage Assessment
NS- national standard
NWR- National Wildlife Refuge
ODRP- Oil Disaster Recovery Program
OY- optimum yield
RESTORE- Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act
RIR- Regulatory Impact Review
SAGARPA- Mexican Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación
SDC- status determination criteria
SEAMAP- Southeast Area Monitoring and Assessment Program
SEDAR- Southeast Data, Assessment and Review
SEFSC- Southeast Fisheries Science Center
SERO- Southeast Regional Office
SFP- Sustainable Fisheries Partnership
SPS- Agreement of Sanitary and Phytosanitary Measures
SSA- Southern Shrimp Alliance
SSC- scientific and statistical committee
SSRG- Social Science Research Group
STF- Shrimp Task Force
TBT- Technical Barriers to Trade
TCC – Technical Coordinating Committee
TED- turtle excluder device
USACE- U.S. Army Corps of Engineers
USDA- U.S. Department of Agriculture
USFDA- U.S. Food and Drug Administration
USFWS- U.S. Fish and Wildlife Service
USCG- Unites States Coast Guard
VMS- vessel monitoring system
WMA- Wildlife Management Area
WTO- World Trade Organization

Executive Summary

This project has been conducted at the request of Louisiana Department of Wildlife and Fisheries and the Louisiana shrimp industry to create a Marine Advancement Plan (MAP) based on assessment of the fishery against internationally recognized standards of sustainability. Comprehensive information on the fishery was gathered through interviews with management and industry representatives, public documents, and research publications, and compared to the Food and Agriculture Organization of the United Nations' (FAO) Code of Conduct for Responsible Fisheries (CCRF). The CCRF is the foundational document for the FAO Ecolabelling Guidelines, and is also the basis of many sustainability certification standards currently used in the marketplace. "A checklist for fisheries resource management issues seen from the perspective of the FAO Code of Conduct for Responsible Fisheries", known as the "Caddy Checklist", was chosen based on its functionality as an operationalized version of the CCRF. The Caddy Checklist focuses on the sustainability of management measures by addressing five key areas of the fishery: fisheries management, fishing operations, integration of fisheries into coastal area management, post-harvest practices and trade, and fisheries research. By taking clauses of the CCRF and transforming statements into questions, it is possible to quantify and score the system used to manage the fishery, to measure the robustness of management and sustainability.

The scope of the Louisiana Shrimp MAP includes the fishery management and operations in Louisiana state waters and U.S. Exclusive Economic Zone (EEZ) waters in the Gulf of Mexico for the two primary shrimp species, brown shrimp (***Farfantepenaeus aztecus***), and white shrimp (***Litopenaeus Setiferus***), taken for human consumption. Primary gear types are otter trawl, skimmer trawl and butterfly nets. The Louisiana shrimp fishery is part of a larger Gulf of Mexico Shrimp Fishery including Texas, Mississippi, Alabama and Florida; however, only Louisiana and federal management systems are evaluated within this report. The Gulf of Mexico fishery is managed by the Gulf of Mexico Fishery Management Council (GMFMC) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) in federal waters, and by the Louisiana Legislature, LDWF and the Louisiana Wildlife and Fisheries Commission (LWFC) within Louisiana state waters.

Of the 174 questions in the SBR used to benchmark the fishery, the Louisiana shrimp fishery received the following rankings, indicating high compliance with CCRF principles:

Louisiana Shrimp Results		
RATING	**description**	**# of questions**
GREEN	full credit	154
AMBER	partial credit	18
RED	no credit	0
N/A	not applicable	2

The following report has been audited by Global Trust Certification, LTD (GTC), a third party sustainability certification organization. GTC has verified that the rationale provided for scoring met the approval of a formal certification assessment body and has provided a set of recommendations to increase the scoring where responses did not meet a GREEN rating.

Introduction

This project has been conducted at the request of LDWF to assess the sustainability of the Louisiana shrimp fishery in the Gulf of Mexico and Louisiana state waters against industry recognized standards of sustainability. The Caddy Checklist was chosen as the basis for the Sustainability Benchmarking Report based on its functionality as an operationalized version of the Code of Conduct of Responsible Fisheries, which is an internationally agreed set of standards developed through the Food and Agriculture Organization of the United Nations (FAO). The Checklist focuses on responsible management; by taking clauses of the Code and transposing statements into questions, it is possible to quantify and score the system used to manage the fishery and measure the robustness of management and sustainability.

The Louisiana shrimp fishery, which is prosecuted within Louisiana state territorial waters and federal EEZ waters of the Gulf of Mexico, is managed regionally through the collaborative efforts of the Gulf of Mexico Fishery Management Council (as established by the Fishery Conservation and Management Act of 1976), NOAA Fisheries, the Louisiana state legislature, and associated regulatory bodies, including the Louisiana Wildlife and Fisheries Commission (LWFC) and LDWF.

John Caddy, the author of the Checklist (1996), makes a number of pertinent observations for how best to utilize the document and where its potential strengths and weaknesses lie. His points are salient and should be borne in mind when examining how this document was used to benchmark the Louisiana shrimp fishery.

When utilizing the checklist, it is important to remember the scope of the document and its intended purpose as it applies to verifying management practices. *"The [...] document concentrates principally on issues related to fisheries management in the narrower sense of resource management, notably those clauses found in Article 7, Fisheries Management. Selected clauses from other Articles, i.e. Article 8, Fishing Operations, Article 10, Integration of Fisheries into Coastal Area Management, Article 11, Post-Harvest Practices and Trade, and Article 12, Fisheries Research, are also included here, where they seem of particular concern to the question of resource management, sensu strictu, but should also be considered separately where this seems appropriate."* Rightfully so, the checklist places the greatest burden of proof on government bodies who ultimately own and control the resources in question. *"A further aspect that was inevitably emphasized by the intergovernmental process that gave rise to the Code is the high proportion of clauses that refer to State responsibility."*

The checklist was designed to take into account all users of the resource, whether high-seas or inshore. However, owing to the level of U.S. state responsibility within the shrimp fishery and the manner by which United States fisheries are managed, additional modifications are necessary. Caddy addresses this issue by saying, *"This questionnaire does not attempt to cover the full scope of [the FAO Code], however, and it will be necessary to delete or modify the asterisked clauses for fisheries wholly under national jurisdiction."* In this case, the checklist has been further modified to address a U.S. fishery that falls under both state and federal jurisdictions. Louisiana shrimp fishery extends beyond state territorial waters and is part of the larger Gulf of Mexico shrimp fishery; therefore, both state and federal management are considered within this report. This checklist will address regional collaboration between state and federal agencies. In other cases, questions with only a 'yes' or 'no' option have been modified to include 'some' in order to better

quantify the efforts of the management agencies.

As an outside and neutral body, Audubon Nature Institute's G.U.L.F. program is capable of maintaining an unbiased view when evaluating Gulf of Mexico state and federal management systems. According to Caddy, this is appropriate given the way in which the checklist was constructed: *"In formulating the individual clauses of the Code as questions, [...] the questions are addressed to a more general audience, when this seemed appropriate, rather than to the "State", so that they can be hopefully answered by different levels of representation of those involved in the fisheries world."* Despite its neutral stance, G.U.L.F.'s answers to the questions found in the checklist will necessarily be subject to the interpretation of the authors, something Caddy himself realized as a reality when using his document. *"There are many pitfalls in attempting to interpret the 'correct' response to, and appropriate overall weighting for, a given question, depending on the definitions followed as well as the point of view. Some simple examples of the problem of definitions are, for example, the common phrases "conservation and management measure", "confidentiality requirements", "complete and reliable statistics", etc."* For this reason, G.U.L.F. has contracted a third party assessment group, Global Trust Certification, Ltd (GTC), to audit this benchmarking report for verification that the scoring and evidence provided meets the approval of an accredited certification body (verification report issued by GTC can be provided upon request.) G.U.L.F. also welcomes feedback from LDWF or other entities that choose to question the interpretations and answers found in this document, and recognizes that this checklist is a living document and continuously under review and updating. We expect that as technologies and regulations change and improve, so will the answers found in this document.

Finally, it is beneficial for the reader to bear in mind that these clauses are not weighted, but instead each is given the same value regardless of its importance. *"The questionnaire begins with Article 7, Fisheries Management, and the assumption that a particular fishery resource, with geographical boundaries, is to be managed, and it attempts to establish whether or not issues raised in the Code of Conduct have been dealt with, totally or in part. A possible scoring for the questions is proposed which can be summed separately for each major Article. These scorings should be interpreted with caution, however, not only because of the subjective nature of the responses but also because no attempt is made to ensure that the scores reflect the relative importance of the questions or of the clauses of the Code that refer to it, nor is it inevitably the case, given the multiplicity of management systems in operation and the differing importance of the individual questions, that a lower score automatically means that one fishery is "less responsible" than another. The scoring may, however, have some value as an incentive for action and can serve as a way of comparing the performance of a given fishery management system for two or more fisheries*." Part of the value of the checklist is that it allows a reviewer to both consider the peculiarities of a given fishery or management plan while still allowing for some standardization of scoring and therefore an additional objective eye on the processes occurring.

The Louisiana shrimp fishery has been benchmarked here against the Caddy Checklist to compare the management system of the resource against the criteria of international best practices. The Caddy Checklist consists of a total of 193 questions that encompass five pertinent areas of the Code. With regard to the Louisiana shrimp fishery, some questions referring to international requirements and fisheries based in developing countries are not applicable. One hundred seventy-four questions were identified, which focus on management, objectives, scientific practices, integration into coastal area management, and policy measures, which are directly applicable to U.S. fisheries in the Gulf of Mexico. What follows is an assessment of the fishery as it currently stands on the date submitted.

The score of "yes"= GREEN, "no" = RED, or "Some"= AMBER is given for each question in the Sustainability Benchmarking Report and is followed by a written response that justifies the rating, provides an explanation or current evidence to support the score, and identifies possible gaps to the particular Code provision under consideration. Each written justification is referenced to sources with websites and other electronic links, when possible, directly below each response to provide access to further information, if desired. Scoring is presented as a "stoplight" system of Red, Amber, Green indicating level of compliance. As noted above, Caddy recommends caution in utilizing the numerical scores, as questions are not weighted.

The following page provides a chart of ranking for each Sustainability Benchmarking Report question, rated as follows:
GREEN= (full credit) **AMBER**= (partial credit) **RED**= (no credit)

N/A= questions that have been excluded from scoring as not relevant at this time

The Louisiana shrimp fishery received the following rankings:
GREEN – 154 AMBER – 18 RED – 0 N/A – 2

Rankings of AMBER and RED are considered gaps in current practices and G.U.L.F., in collaboration with stakeholders, will utilize these responses in creating a subsequent MAP report designed to address gaps and advance of the fishery towards greater sustainability.

7 – Fisheries Management	Rating
7.1.1 (a)	
7.1.1. (b)	
7.1.1. (c)	
7.1.2 (a)	
7.1.2 (b)	
7.1.3 (a)	
7.1.3 (b)	
7.1.4	
7.1.4 (a)	
7.1.4 (b)	
7.1.4 (d)	
7.1.4 (e)	
7.1.6 (a)	
7.1.6 (b)	
7.1.7 (a)	
7.1.7 (b)	
7.1.8 (a)	
7.1.8 (b)	
7.1.9 (i) – Assessment	
7.1.9 (ii) – Management	
7.1.9 (iii) – Decision making	
7.1.10	
7.2.1 (a)	
7.2.1 (b)	
7.2.1 (c)	
7.2.2 (a)(i) – Capacity defined	
7.2.2 (a)(ii)– Capacity avoided	
7.2.2 (b) – Economic conditions	**N/A**
7.2.2 (c) – Small-scale interests	
7.2.2 (d) – Biodiversity conserved	
7.2.2 (e) – Depleted stocks	
7.2.2 (f) – Environmental impacts	
7.2.2 (g)(i) – Pollution	
7.2.2 (g)(ii) – Ghost fishing	
7.2.2 (g)(iii) – Fishing methods	
7.2.3	
7.3.1 (a)	
7.3.1 (b)	
7.3.1 (c)	
7.3.1 (d)	
7.3.1 (f)	
7.3.2	
7.3.3 (i) – Plan exists	
7.3.3 (ii) – Plan subscribed to	
7.3.4 (i) – Information gathering	
7.3.4 (ii) – Research	
7.3.4 (iii) – Management	
7.3.4 (iv) – Development	
7.4.2 (i) – Resource	
7.4.2 (ii) – Climate & environment	
7.4.2 (iii) – Socio-economics	
7.4.3 (i) – Cost-benefit	
7.4.3 (ii) – Alt. management	
7.4.4	
7.4.5	
7.4.6 (i) – Agreed format	
7.4.6 (ii) – Timely manner	
7.4.7	
7.5.1 (a)	
7.5.1 (b)	
7.5.2 – Target reference points	
7.5.2 – Limit reference points	
7.5.2 – Research procedures	
7.5.2 – Management actions	
7.5.5 (a)	
7.5.5 (b)(i) – Natural phenomena	
7.5.5 (b)(ii) – Fishing impact	
7.6.1	
7.6.2	
7.6.3 (a)	
7.6.3 (b)	
7.6.5	
7.6.6	
7.6.7	
7.6.8 (i) – Review procedures	
7.6.8 (ii) – Flexible mechanism	
7.6.9 (a)(i) – Waste and discards	
7.6.9 (a)(ii) – Non-target catch	
7.6.9 (a)(iii) – ETP species	
7.6.9 (b)(i) – Fish size	
7.6.9 (b)(ii) – Gear	
7.6.9 (b)(iii) – Discards	
7.6.9 (b)(iv) – Seasons	
7.6.9 (b)(v) – Closed areas	
7.6.9 (b)(vi) – Artisanal areas	
7.6.9 (b)(vii) – Juveniles	
7.6.9 (c)	
7.6.10	
7.7.1	
7.7.2 (a)	
7.7.2 (b)	
7.7.2 (c)	
7.7.3 (i) – MCS	

7.7.3 (ii) – Observers	
7.7.3 (ii) – Inspection	
7.7.3 (iv) – VMS	
7.7.5 (a)	
7.7.5 (b)	

8 – Fishing Operations	**Rating**
8.1.1	
8.1.2	
8.1.3	
8.1.4	
8.1.7	
8.1.8	
8.1.9	
8.1.10	
8.2.1 (a)	
8.2.1 (b)	
8.2.4	
8.2.7 (a)	
8.2.7 (b)	
8.4.2	
8.4.3 (a)(i) – Fishing operations	
8.4.3 (a)(ii) – Non-fish catches	
8.4.3 (a)(iii) – Fish catches	
8.4.3 (b)	
8.4.4	
8.4.5	
8.4.6	
8.4.7	
8.4.8 (i) – Environmental impacts	
8.4.8 (ii) – Social impacts	
8.4.8 (iii) – Biodiversity impacts	
8.4.8 (iv) – Coastal fisheries	
8.5.1 (a)	
8.5.1 (a) Supplemental	
8.5.1 (b)	
8.5.2	
8.5.3	
8.5.4	

10 – Institutional Framework	**Rating**
10.1.1	
10.1.2	
10.1.3	
10.1.4 (a)(i) – bottom users	
10.1.4 (a)(ii) – bottom users & others	
10.1.4 (b)	
10.2.1	
10.2.2 (i) – Economic	
10.2.2 (ii) – Social & cultural	
10.2.3	
10.2.4	
10.2.5 (i) – Environment & biology	
10.2.5 (ii) – Economy & social	
10.2.5 (iii) – Legal & institutional	
10.3.1 (i) – Use of resources	
10.3.1 (ii) – Conservation of env.	

11 – Post-harvest Practices & Trade	**Rating**
11.1.11	
11.2.3	

12 – Fisheries Research	**Rating**
12.1 (a)	
12.1 (b)	
12.1 (c)	
12.2	
12.3 (a)	
12.3 (b)	
12.3 (c)	
12.4 (a)	
12.4 (b)	
12.5 (a)	
12.5 (b)	
12.6	
12.7 (a)	
12.7 (b)	
12.8 (a)	
12.8 (b)	
12.10 (a)	
12.10 (b)	
12.10 (c)	
12.11 (a)	
12.11 (b)	
12.12	
12.13 (a)	
12.13 (b)	
12.14	**N/A**
12.17	

Article 7 – Fisheries Management

7.1.1 (a) Are conservation and management measures based on the best scientific evidence available? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
The Louisiana shrimp fishery includes shrimp harvested within Louisiana state territorial waters and shrimp harvested within the U.S. EEZ in Gulf of Mexico waters adjacent to Louisiana. Approximately 67% of shrimp landed in the Louisiana fishery are harvested within state territorial waters.[1] Based on stock determinations, the predominant shrimp species harvested in Louisiana (brown shrimp and white shrimp) are part of larger Gulf of Mexico shrimp stocks that span the territorial waters of Texas, Louisiana, Mississippi, Alabama, and Florida, as well as federal waters in the Gulf of Mexico. Management of the shrimp fishery within the U.S EEZ is the responsibility of the Gulf of Mexico Fishery Management Council (GMFMC) and NOAA Fisheries; this includes waters from three nautical miles (nm) out to 200 nm from the shoreline. (NOTE: Louisiana has passed state legislation claiming state waters extending out to nine nautical miles; however, this has not yet been recognized federally for the shrimp fishery.) Individual states maintain responsibility for management within state waters; therefore, the Louisiana State Legislature, Louisiana Wildlife and Fisheries Commission (LWFC) and Louisiana Department of Wildlife and Fisheries (LDWF) manage the fishery within state territorial waters. Louisiana participates in the GMFMC and manages the shrimp fishery in state waters consistent with federal regulations. Louisiana also works collaboratively with the other Gulf State agencies through the Gulf States Marine Fisheries Commission (GSMFC) to ensure that shrimp stocks within the Gulf are managed consistently. All agencies involved in the management of this fishery utilize the best scientific evidence available as the foundation for conservation and management measures. **<u>Federal</u>:** The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA (first enacted in 1976, and amended in 1996 and 2006) is the primary law governing fisheries management in the U.S.[2] The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management. National Standard 2 (NS2) requires that "*Conservation and management measures shall be based upon the best scientific information available.*"[3] The MSA, section 302(g)(1)(A) requires each regional management council to form a Scientific and Statistical Committee (SSC) to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides ongoing scientific advice for fishery management decisions. The SSC reviews reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices and provides recommendations to the Council.[4] Recommendations by the SSC		

include acceptable biological catch, maximum sustainable yield (MSY), and methods for preventing overfishing achieving rebuilding targets, among others. The SSC typically includes economists, biologists, sociologists and natural resource attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf states.

NOAA Fisheries Southeast Fisheries Science Center (SEFSC), based in Miami, FL, is the branch responsible for providing multi-disciplinary research to support management decisions of the GMFMC and NOAA Fisheries.[5] SEFSC maintains labs in Galveston, TX; Lafayette, LA; Panama City, FL; Pascagoula, MS and Stennis, MS. SEFSC Research and Data programs are responsible for biological, economic and socio-cultural research and data collection for commercial and recreational fisheries. SEFSC conducts stock assessments for all species managed by GMFMC; stock assessments for shrimp are conducted through the Galveston Lab Shrimp Fishery Research Program.[6] The SEFCS collects fishery-dependent data for the shrimp fishery through the Gulf Shrimp System (GSS). The GSS utilizes port agents throughout the Gulf of Mexico to collect landings data (amount and value) from seafood dealers, and interview data (fishing effort and location) from fishermen.[7] Additionally, all federal Gulf shrimp permit holders are required to report annual landings each year through the Annual Landings Form (ALF) as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data.[8] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program managed by the Galveston Lab. The Galveston Lab focuses research efforts on Fishery Management, Fishery Ecology and Protected Species with strong emphasis on the shrimp fishery.[9] The ELB program began in 2007 and between 2007 and 2013, NOAA Fisheries funded and collected data on approximately 500 shrimp vessels through the program.[10] In 2014, the program changed format to a cELB program and continues to use a stratified random sampling method to select participants each year. If selected, Gulf shrimp permit holders are required to participate in the program and permit renewal is contingent upon participation. The ELB program collects data on amount and location of shrimp landings. Gulf shrimp permit holders are also required to carry an observer if selected for the Galveston Laboratory Observer Program. Similar to the ELB program, permit holders are selected by the Southeast Regional Director through a stratified random sampling method. The focus of data collection for the shrimp fishery Observer Program is bycatch and bycatch reduction device (BRD) evaluation.[11] For the Gulf shrimp fishery, there is a heavy focus on research regarding bycatch.[12] The Pascagoula Lab in Mississippi houses the Harvesting Systems Unit, a team of biologists and gear specialists who perform critical research on fishing gear. The Harvesting Systems Unit does extensive research on BRDs for the Gulf of Mexico shrimp fishery, including cooperative research with commercial industry members to test improved gear designs, and also conducts trainings and courtesy inspections across the Gulf on commercial shrimp boats to ensure proper use of turtle excluder devices (TEDs) and BRDs.[13]

GMFMC implemented the Shrimp Fishery Management Plan (FMP) in 1981, which included brown shrimp, white shrimp, pink shrimp (*Penaeus duorarum*), royal red shrimp (*Pleoticus robustus*), seabobs (*Xiphopeneus kroyeri*) and rock shrimp (*Sicyonia brevirostris*) in the Gulf of Mexico. Seabobs and Rock shrimp have since been removed from the plan, and the current Shrimp FMP covers management of white, brown, pink and royal red shrimp. The Shrimp FMP is under constant revision based on ongoing research and best available science and the FMP has been amended 16 times since implementation.[14]
The goals/objectives of Shrimp FMP are:[15]

- Optimize the yield from shrimp recruited to the fishery
- Encourage habitat protection measures to prevent undue loss of shrimp habitat
- Coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible.
- Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act
- Minimize the incidental capture of finfish by shrimpers, when appropriate
- Minimize adverse effects of underwater obstructions to shrimp trawling
- Provide for statistical reporting system

Louisiana:
Management of the shrimp fishery in Louisiana waters is separate from, but consistent with, federal management. Louisiana representatives sit on the GMFMC and associated scientific and advisory panels and participate in regional research activities. LDWF incorporates research and recommendations by regional bodies into management decisions.

The shrimp fishery within Louisiana state waters is regulated under Louisiana Law, including Louisiana Revised Statutes Title 56 and Louisiana Administrative Code Title 76. The LWFC, established by Louisiana Revised Statutes Title 56, is charged with protecting, conserving, and replenishing the natural resources of the state and has the authority to define management programs and policies.[16] LDWF, established by Louisiana Revised Statutes Title 36, is the department responsible for executing the laws enacted for management and conservation of natural resources and carries out the management programs and policies defined by the LWFC.[17] LDWF is granted the power to promulgate rules and regulations necessary to implement the provisions of Title 56.[18] LDWF is mandated to employ scientists who are certified to study the wildlife of the state and report findings to LWFC and LDWF for use in management decisions.[19]

The LDWF Fisheries Division mission statement is "*To manage living aquatic resources and their habitat; to support the fishing industry; and to provide access, opportunity and understanding of Louisiana's aquatic resources to the State's citizens and other beneficiaries of these sustainable resources.*"[20] The LDWF Fisheries Division conducts both fishery-dependent and fishery-independent data collection, which is reviewed annually to determine trends and status of stocks. Management recommendations made to the

LWFC are based on this scientific evidence.

The LDWF Fisheries Division conducts sampling according to a schedule laid out in the Marine Fisheries Section Core Sampling Programs handbook.[21] The Louisiana coast is divided into five hydrological basins with a field office leading sampling activities in each basin. Gear types include 6' inshore trawl, 16' Inshore trawl, 20' nearshore trawl, gillnet, seine, and trammel net. Regular sampling is conducted monthly with additional sampling added seasonally for specific needs. Shrimp abundance, using several types of trawl gear, is sampled throughout the year along with environmental and hydrological data at each sampling site. The white shrimp and brown shrimp seasons are opened and closed based on the biological data gathered during sampling.[22]

LDWF implemented the Trip Ticket Program for fishery-dependent data collection in 1999.[23] The Trip Ticket Program is a mandatory reporting program for catch data at the trip level reported by dealers on a monthly basis and minimum data required includes: trip date, trip number, vessel ID number, participant ID number, species, quantity landed, landing condition, market size range, ex-vessel value, location landed, dealer ID, transaction date, gear used, and area fished. Data gathered through this program are utilized by the LDWF Socioeconomic Research and Development Section.

The Louisiana Shrimp FMP, recently updated in July 2015, includes biological, and socioeconomic information on the fishery based on ongoing research and addresses additional research needs.[24] The management objectives of the Louisiana Shrimp FMP are:

- Enhance economic value of the shrimp resource by promoting more effective and efficient harvesting strategies and practices.
- Achieve a level of fishing capacity that provides for a sustainable harvest and allows for a profitable fishery.
- Minimize incidental harvest of finfish, crustaceans, and protected species.
- Promote the protection, restoration, and enhancement of habitat and environmental quality necessary for sustaining the shrimp resource.
- Reduce conflicts among and within user groups, including non-shrimping user groups and activities.
- Minimize adverse effects of underwater obstructions to shrimp trawling.
- Reduce to the maximum extent possible waste of the resource by discouraging operations that result in culling to increase size of retained harvest.
- Promote research, surveys, and outreach efforts that contribute to achieving management goals and objectives.

[1] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[2] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[3] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[4] 50 CFR §600.133 (Scientific and Statistical Committee) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[5] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[6] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[7] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[8] NOAA Fisheries. "2010 Analysis of Gulf Shrimp Moratorium Permits."

[9] "Research" Sou*theast Fisheries Science Center, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/research_home/index.html

[10] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[11] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[12] "Shrimp Researched & Managed by the SEFSC" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/shrimp/

[13] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[14] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[15] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[16] La. R.S. 56 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/34690-title-56/2010title56complete.pdf

[17] La. R.S. 36:602 https://legis.la.gov/Legis/Law.aspx?d=92804

[18] La. R.S. 56 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/34690-title-56/2010title56complete.pdf

[19] La. R.S. 56:6 http://law.justia.com/codes/louisiana/2011/rs/title56/rs56-6/

[20] "Fisheries Division" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/fisheries-division

[21] LDWF. "Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs." Louisiana Department of Wildlife and Fisheries. June 2015.

[22] Bourgeois et al., 2015

[23] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

[24] Bourgeois et al., 2015

7.1.1 (b) Are conservation and management measures designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization and maintain their availability for present and future generations? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Conservation and management measures at both the state and federal level are designed to ensure long-term sustainability and promote optimum utilization. **<u>Federal</u>:** The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA, which is the primary law governing fisheries management in the U.S.[1] National Standard 1 (NS1) of the MSA mandates that "*Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.*"[2] Current guidelines for NS1 require specification of MSY and Optimum Yield (OY), based on the best scientific evidence available, for each fishery managed by the Councils. Additionally, NS1 requires specification of status determination criteria (SDC) so that overfishing and overfished determinations can be made for stocks in the fishery. The NS1 guidelines are designed to prevent overfishing and ensure that the fishery achieve OY and require corrective actions to be taken to rebuild stocks if overfishing or overfished conditions occur. The GMFMC implemented the Shrimp FMP in 1981, which currently includes brown shrimp, white shrimp, pink shrimp, and royal red shrimp in the Gulf of Mexico.[3] The goals/objectives of Shrimp FMP include optimizing the yield of shrimp recruited to the fishery and habitat protection measures to prevent undue loss of shrimp habitat. Amendment 5 of the Shrimp FMP defined overfishing and provided measures to restore overfished stocks, should overfishing occur, for brown, pink and royal red shrimp.[4] Amendment 7 similarly defined overfishing and measures to restore stocks if overfished for white shrimp.[5] Amendment 13 further defined reference points for each of the penaeid shrimp species to comply with the requirements of MSA NS1 and includes definitions of Maximum Fishing Mortality Threshold (MFMT) and Minimum Stock Size Threshold (MSST).[6] The GMFMC manages the shrimp fishery in relation to these reference points to ensure optimal yield and long-term availability for future generations. Additionally, Amendment 13 implemented a 10-year moratorium on new permits for the federal shrimp fishery, capping the number of licenses in the fishery. In 2015, Amendment 15 was passed to redefine the SDC for the shrimp fishery based on updates to the stock		

assessment model. Amendment 17 is currently being drafted to address the end of the 10 year permit moratorium, which will expire in December of 2016.[7,8]
The MSA section 306 pertaining to state jurisdictions does provide authority of the U.S. Secretary of Commerce, in the event that a state takes any action, or omits to take action, which would substantially and adversely affect the carrying out of a federal FMP, the ability to regulate the fishery within state boundaries pursuant to the FMP and regulations promulgated to implement that FMP.[9]

Louisiana:
The marine resources of Louisiana are managed by the Louisiana State Legislature, LWFC and LDWF. Sustainability and optimal utilization for current and future generations has been identified as a priority for LDWF and is mandated by Louisiana Revised Statutes Title 56, Section 638.3.[10]

The mission of the LDWF Office of Fisheries is "to manage living aquatic resources and their habitat, to support the fishing industry, and to provide access, opportunity and understanding of the Louisiana aquatic resources to the State's citizens and others beneficiaries of these sustainable resources."[11] Such tasks are carried out by legislative actions through the Louisiana Revised Statutes, Title 56 and rules promulgated through the Louisiana Administrative Code, Title 76 (Wildlife and Fisheries).[12,13]

Several sections within Title 56 provide for the prohibition or limiting of take, if found to be in the best interest of the state (R.S. 56:22, 56:640.3, 56:1903).[14,15,16] Additionally, Louisiana Revised Statutes 56:409.1 prohibits the waste of any fish of the state; "waste" meaning the harvest of any fish for commercial purposes which results in the excessive killing of such fish.[17]

With respect to the shrimp fishery, LDWF monitors shrimp populations and fishing activity through the fishery independent monitoring program and the trip ticket program, and has several technical measures in place for the protection of shrimp populations and habitat. Shrimp are a very robust resource, considered an annual crop, and able to quickly replenish their numbers under favorable environmental conditions; thus, shrimp are not overly susceptible to fishing pressure.[18] LDWF manages the shrimp fishery through seasonal closures to ensure that enough mature shrimp survive to reproduce and to allow for shrimp to grow to marketable size prior to harvest. Seasons are opened to shrimping when monitoring programs indicate that shrimp have reach, at minimum, 100 count (100 individual shrimp per one pound), or are determined to be at a 'marketable size'. State waters available to shrimping are divided into inside waters (inland from the coastline and further divided into major estuarine basins) and outside waters (from the coastline out to three nautical miles). Louisiana typically has three shrimp seasons – a spring inshore season from May through July targeting mainly brown shrimp, a fall inshore shrimp season from August to December mainly targeting white shrimp, and a season for outside waters that may remain open year-round or have a winter closure to protect overwintering white shrimp. These seasons are flexible and are set by LWFC each year based on biological and environmental data on shrimp abundance

from fishery-independent sampling.[19] Louisiana also has area restrictions for shrimpers. Sanctuaries are established in Lake Pontchartrain and Lake Catherine where commercial fishing and recreational shrimping are prohibited.[20] Commercial fishing is also prohibited in the coastal National Wildlife Refuges (NWR) including Big Branch Marsh NWR, Brenton NWR, Delta NWR, Sabine NWR, and Shell Keys NWR.[21] Additional wildlife management areas (WMAs) and habitat conservation areas may also be closed to certain gears and fishing methods. The management goals objectives of the Louisiana Shrimp FMP are:[22] - Enhance economic value of the shrimp resource by promoting more effective and efficient harvesting strategies and practices. - Achieve a level of fishing capacity that provides for a sustainable harvest and allows for a profitable fishery. - Minimize incidental harvest of finfish, crustaceans, and protected species. - Promote the protection, restoration, and enhancement of habitat and environmental quality necessary for sustaining the shrimp resource. - Reduce conflicts among and within user groups, including non-shrimping user groups and activities. - Minimize adverse effects of underwater obstructions to shrimp trawling. - Reduce to the extent possible waste of the resource by discouraging operations that result in culling to increase size of retained harvest. - Promote research, surveys, and outreach efforts that contribute to achieving management goals and objectives.		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[4] GMFMC. *Amendment 5 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*.1991. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-05%20Draft%201991-01.pdf

[5] GMFMC. *Amendment 7 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*.1994. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-07%20Final%201994-05.pdf

[6] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[7] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[8] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[9] MSA Section SEC. 306. STATE JURISDICTION http://www.mmc.gov/legislation/pdf/msa306.pdf

[10] La. R.S. 56:638.3 https://legis.la.gov/Legis/Law.aspx?d=105459

[11] LDWF. *Louisiana Department of Wildlife and Fisheries Strategic Plan 2014-15 through 2018-19*. July 2013. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/32540-about-ldwf/strategicplanjuly2013.pdf

[12] La. R.S. 56 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/34690-title-56/2010title56complete.pdf

[13] La. Admin. Code Title 76 http://www.doa.la.gov/Pages/osr/lac/books.aspx

[14] La. R.S. 56:22 https://legis.la.gov/Legis/Law.aspx?d=105076

[15] La. R.S. 56:640.3 https://legis.la.gov/Legis/Law.aspx?d=105475

[16] La. R.S. 56:1903 https://legis.la.gov/Legis/Law.aspx?d=105017

[17] La. R.S. 56:409.1 https://legis.la.gov/Legis/Law.aspx?d=105274

[18] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[19] Bourgeois et al., 2015

[20] La. R.S. 56:804 http://law.justia.com/codes/louisiana/2013/code-revisedstatutes/title-56/rs-56-804

[21] "List of National System MPAs" *NOAA National Marine Protected Areas Center*. Web. Accessed November 2015. http://marineprotectedareas.noaa.gov/pdf/national-system/nationalsystem_siteslist_0713.pdf

[22] Bourgeois et al., 2015

7.1.1 (c) Are management measures currently in effect in the fishery designed for the long-term conservation and sustainable use of fishery resources, as opposed to reasons of short-term expediency? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The state and federal management agencies (LDWF, GMFMC, and NOAA Fisheries) work together to ensure that management measures in both jurisdictions are designed for long-term conservation and sustainable use. **<u>Federal</u>:** The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA, which is the primary law governing fisheries management in the U.S.[1] National Standard 1 (NS1) of the MSA requires "*Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.*"[2] The current guidelines for NS1 and measures implemented through the GMFMC Shrimp FMP and amendments, as noted above in response to 7.1.1(b), are designed for long-term, sustainable use of the fishery. See previous response for details.		

Louisiana:

The marine resources of Louisiana are managed by LWFC and LDWF. Sustainability and optimal utilization for current and future generations has been identified as a priority for LDWF and is mandated by Louisiana Revised Statutes Title 56, Section 638.3.[3] LWFC and LDWF manage the fishery in accordance with the fishery standards defined in Louisiana Revised Statutes 56: 638.5:[4]

1. Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY while maintaining healthy, plentiful stocks. In fact, every effort will be made at all times to prevent a harvest from exceeding the safe upper limit of harvests which can be taken consistently year after year without diminishing the stocks so that the stock is truly inexhaustible and perpetually renewable.
2. Conservation and management measures shall be based upon the best scientific, economic, biological, anthropological, and sociological information available.
3. To the extent practicable, an individual stock or unit of fish shall be managed as a unit throughout its range within the state's jurisdictional authority and interrelated stocks of fish and other saltwater resources shall be managed in close coordination.
4. If it becomes necessary to allocate or assign fishing privileges among various fishermen, such allocations to the extent practicable shall be:
    a) Fair and equitable to all such fishermen.
    b) Reasonably calculated to promote conservation.
    c) Carried out in such a manner that no particular individual, corporation, or other legal entity acquires an excessive share of such privileges.
    d) In the best interest of the citizens of Louisiana.
5. Conservation and management measures shall, where practicable, promote efficiency in the conservation and management of fishery resources; except that no such measure shall have economic allocation as its sole purpose.
6. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.
7. Conservation and management measures may take into account and allow for variations among, and contingencies in, fisheries resources and catches.

Several sections within Title 56 provide for the prohibition or limiting of take, if found to be in the best interest of the state (R.S. 56:22, 56:640.3, 56:1903).[5,6,7]

The 2015 Louisiana Shrimp FMP identifies the need to achieve a level of fishing capacity that provides for a sustainable harvest and allows for a profitable fishery.[8] The shrimp fishery has open and closed seasons, the dates for which are set based on environmental and scientific evaluation parameters to ensure that shrimp are harvested at marketable size. Louisiana also has area restrictions where commercial shrimping is prohibited to protect valuable habitat.

In the case of an emergency (including evidence of overfishing or a severe disaster),

the Secretary of the LFWC has the authority to institute a closure of a fishery not to exceed a length of seven days after the next Commission meeting, without having to bring the matter before the Commission or other regulatory bodies.[9] This allows for the immediate termination of activities that may be harmful either to the fishery or the people of Louisiana in the event of an emergency situation (for example- Deepwater Horizon Oil Spill). LDWF also participates in the GMFMC process and complies with the conservation and management measures developed by the GMFMC to ensure that Gulf of Mexico shrimp stocks are managed for long-term, sustainable use.		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] La. R.S. 56:638.3 https://legis.la.gov/Legis/Law.aspx?d=105459

[4] La. R.S. 56: 638.5 (Fishery standards) https://legis.la.gov/Legis/Law.aspx?d=105461

[5] La. R.S. 56:22 https://legis.la.gov/Legis/Law.aspx?d=105076

[6] La. R.S. 56:640.3 https://legis.la.gov/Legis/Law.aspx?d=105475

[7] La. R.S. 56:1903 https://legis.la.gov/Legis/Law.aspx?d=105017

[8] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.54 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[9] La. R.S. 56:6.1 https://legis.la.gov/Legis/Law.aspx?d=105431

7.1.2 (a) Have attempts been made to identify domestic parties having a (legitimate) interest in the use and management of fisheries resources? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: The GMFMC is responsible for monitoring and amending FMPs to best use the fishery resources in the Gulf of Mexico.[1] In doing so, GMFMC solicits participation from the entire fishing community. Their meetings are open to the public and public participation is actively encouraged. GMFMC uses a public "scoping" period and schedules public hearings to engage stakeholders with the goal of identifying issues, potential impacts, and alternative solutions to fishery management measures. Once a draft plan is prepared, it is presented to the public through hearings/meetings throughout the Gulf Coast for feedback. Comments submitted at these meetings are recorded and displayed on the GMFMC website. GMFMC also accepts comments through comment forms on their website, via email and mail. All comments are reviewed before FMP decisions are finalized. This final action also occurs publically,		

during GMFMC meetings.[2] GMFMC also communicates publicly via newsletters, social media posts, and cell phone applications, all in an effort to effectively disseminate conservation and management information.[3]Additionally, for each FMP, there is an AP composed of users of the fishery resource. Commercial and recreational fishermen, buyers, sellers, and consumers are all represented. The AP assists in advising GMFMC in the development of FMPs.[4]

NOAA Fisheries relies on communication with the public to enhance transparency and increase public confidence in management activities. NOAA Fisheries publishes public comments on their website each month.[5] All reports, including their latest shrimp stock assessments, are publically accessible via their website.[6]
NOAA Fisheries Southeast Regional Office (SERO) posts updated links to published fishery bulletins seeking public comment on proposed fishery regulation changes.[7,8] Their website also contains a News Room link where the public may access recent media activity.[9]

Louisiana:
LDWF solicits participation from the entire fishing community and is required by law at both the state and federal level to allow public participation.

As a government bodies, LWFC and LDWF falls under the Louisiana Open Meetings Law (La. R.S. 42:12-28) requiring that all meetings of a government body be open to the public and that the date, time, place and agenda of the meeting be publically posted prior to that date.[10] LWFC meetings are held monthly and follow the Open Meetings Law. Information is publically posted via the LDWF website and a public comment period is scheduled during each meeting.[11] LDWF may also conduct industry scoping meetings during development of new regulations or to address specific issues with the fishing community. LDWF posts proposed rules and public notices on their website and accepts comments through mail and email.[12]

The Louisiana Shrimp Task Force (STF) includes representatives from the shrimping industry and state agencies, and is responsible for making recommendations to LDWF and LWFC based on the feedback from fishery users, including harvesters, a nominee from the American Shrimp Processors Association (ASPA), and an active dock buyer of shrimp.[13] Mandates of the STF, under La. R.S. 56:494, include improving shrimp production and marketability, and making recommendations for how to enhance overall performance of the domestic shrimp industry.[14] STF meetings are also governed under the Louisiana Open Meetings Law, and are open to the public.[15]

Louisiana is also a member of the GSMFC. GSMFC is an organization of the five Gulf states that works together to conserve, develop, and fully utilize fishery resources. Each Gulf state is represented equally as GSMFC Commissioners, which set policy, approve budgets, and direct GSMFC activities. GSMFC serves as a discussion center for marine resource issues, allowing stakeholders to voice concerns and opinions regarding fishery resource management. GSMFC meetings are open to the public and allow for public comment periods. Meeting dates, locations and

agendas can be found on the GSMFC website.[15] Several industry led organizations also exist to represent shrimp fishery stakeholders in the Louisiana and Gulf region including the Louisiana Shrimp Association (LSA), the (ASPA), and the Southern Shrimp Alliance (SSA). The LSA is a nonprofit organization, founded in 2002, consisting of commercial shrimpers, seafood dealers, statewide merchants and other individuals invested in the Louisiana shrimp industry. The goal of this group is to incorporate participation of all sectors of the industry in preserving the culture and heritage of the traditional Louisiana shrimper. ASPA is a separate industry-led organization for the shrimping industry based in Mississippi. ASPA's goal is to represent the interests of domestic shrimp processors and provide a collective voice for the industry. ASPA works with research and regulatory agencies to collect, prepare, and disseminate important industry information.[17] SSA is an industry-led organization composed of shrimp fishermen, processors, and other shrimp industry members from the eight warm water shrimp producing states in the South: Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas. SSA works as an advocate for the domestic shrimping industry, attempting to preserve the fishery by supporting state programs that promote domestic shrimp.[18]		

[1] "Gulf Council FAQs" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/resources/education_faqs/education_council_faqs.php

[2] "Scoping through Implementation" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/scoping-thru-implementation.php

[3] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[4] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[5] "Enhancing Transparency" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/management/recreational/policy/goal_4.html

[6] "Stock Status Updates" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html

[7] "Fishery Bulletin Archives" *NOAA Fisheries Southeast Regional Office.* Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/bulletin_archives/index.html

[8] "Fishery Bulletins" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/index.html

[9] *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/index.html

[10] La. R.S. 42:12-28 (Open Meetings Law) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[11] "Commission agendas" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commissionagenda1

[12] "Action Items" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/action-items

[13] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

[14] La. R.S. 56:494 https://legis.la.gov/Legis/Law.aspx?d=105348

[15] "Shrimp Task Force Meetings" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/meetings

[16] *Louisiana Shrimp Association*. Web. Accessed November 2015. http://www.louisianashrimp.org/

[17] *American Shrimp Processors Association.* Web. Accessed November 2015. http://www.americanshrimp.com/association/about/

[18] *Southern Shrimp Alliance*. Web. Accessed November 2015. http://www.shrimpalliance.com/about/

7.1.2 (b) Have arrangements been made to consult these parties and gain their collaboration?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: All GMFMC meetings are open to the public.[1] Furthermore, public participation and collaboration is actively encouraged through what GMFMC identifies as a "scoping" period where stakeholders are invited to meet early in the FMP process with the goal of identifying issues, potential impacts, and alternative solutions to fishery management measures. Once a draft plan is prepared, it is presented to the public again through hearings/meetings throughout the Gulf Coast for feedback. Comments submitted at these meetings are recorded and displayed on the GMFMC website. GMFMC also accepts additional comments through comment forms on their website, via email and mail. All comments are reviewed before FMP decisions are finalized. This final action also occurs publically, during GMFMC meetings.[2] Additionally, for every FMP, there is an AP composed of users of the fishery resource. Commercial and recreational fishermen, buyers, sellers, and consumers are all represented. The AP assists in advising GMFMC in the development of FMPs. The SSC, made up of experts and scientists, also advises GMFMC.[3] NOAA Fisheries publishes public comments on their website each month.[4] All reports, including their latest shrimp stock assessments, are publically accessible via their website.[5] NOAA Fisheries SERO posts updated links to published fishery bulletins seeking public comment on proposed fishery regulation changes. [6,7]		

Louisiana: LWFC meetings are held each month on the first Thursday of the month at LDWF headquarters in the state capital, Baton Rouge, unless otherwise announced and are open to the public as required by the Louisiana Open Meetings Law.[8] Information of meeting date, time, location, and purpose is publically posted via the LDWF website prior to the meeting and a public comment period is scheduled during each meeting to allow for public input.[9] LDWF may also conduct industry scoping meetings during the development of new regulations or actions for a fishery. LDWF posts proposed rules and public notices on the website, and allows for written comment by mail or email.[10] If any change in management is put before the LWFC, including adoption of alternative management measures that would affect members of the shrimp industry, a Fiscal and Economic Impact Statement must be prepared to summarize potential economic and social effects, and what costs could be incurred by the regulation change.[11] The Louisiana STF, whose members include both industry and state management representatives, collaborate on issues of importance, including representing the interests of the shrimp fishery before state and federal bodies.[12,13] The STF also falls under the Louisiana Open Meetings Law and all meetings are open to the public.[14] Louisiana gains industry and stakeholder input through participation in the GSMFC. GSMFC serves as a discussion center for marine resource issues, allowing stakeholders across all five Gulf states to voice concerns and opinions regarding fishery resource management. GSMFC meetings are open to the public and allow for public comment periods. Meeting dates, locations and agendas can be found on the GSMFC website.[15] Additionally, several industry-led organizations exist to represent the interests of the Louisiana and Gulf shrimp industries, such as LSA, ASPA, and SSA. These organizations gather feedback from members of the shrimp industry and participate in the Louisiana STF, GMFMC APs and provide public comment to state and federal regulators on behalf of their members.[16,17,18]		

[1] "Gulf Council FAQs" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/resources/education_faqs/education_council_faqs.php

[2] "Scoping through Implementation" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/scoping-thru-implementation.php

[3] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[4] "Enhancing Transparency" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/management/recreational/policy/goal_4.html

[5] "Stock Status Updates" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html

[6] "Fishery Bulletin Archives" *NOAA Fisheries Southeast Regional Office.* Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/bulletin_archives/index.html

[7] "Fishery Bulletins" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/index.html

[8] La. R.S. 42:12-28 (Open Meetings Law) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[9] "Commission agendas" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commissionagenda1

[10] "Action Items" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/action-items

[11] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.54 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[12] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

[13] La. R.S. 56:494 https://legis.la.gov/Legis/Law.aspx?d=105348

[14] "Shrimp Task Force Meetings" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/meetings

[15] *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/index.php

[16] *Louisiana Shrimp Association*. Web. Accessed November 2015. http://www.louisianashrimp.org/

[17] *American Shrimp Processors Association.* Web. Accessed November 2015. http://www.americanshrimp.com/association/about/

[18] *Southern Shrimp Alliance*. Web. Accessed November 2015. http://www.shrimpalliance.com/about/

7.1.3 (a) Where transboundary, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more states, do the states concerned cooperate to ensure effective conservation and management of the resources? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
As noted in the Louisiana Shrimp FMP, brown and white shrimp are found in both state and federal waters of the Gulf of Mexico and stocks are continuous across jurisdictions of all five U.S. Gulf States and federal waters. These stocks are, therefore, assessed on a Gulf-wide basis and managed interjurisdictionally.[1] Management of the Gulf of Mexico shrimp fishery is the responsibility of the GMFMC and NOAA Fisheries in waters federal waters. Individual states maintain responsibility for management within state waters; therefore, LDWF is responsible for management of shrimp in Louisiana state waters out to three nautical miles. The		

Louisiana state legislature, in 2011, enacted legislation declaring that state territorial waters extend to nine nautical miles (three marine leagues); however, this change has not been recognized by the federal government and NOAA Fisheries continues to manage the shrimp fishery starting at the three nautical mile boundary.[2] LDWF is a member of GMFMC and collaborates with other state and federal agencies on shrimp management in the Gulf. Louisiana Revised Statutes Title 56 Section 74-87 pertains to Louisiana's participation in the Commission.

The GMFMC is one of the regional Fishery Management Councils established by the Fishery Conservation and Management Act of 1976.[3] The GMFMC consists of 17 voting members, including the Southeast Regional Administrator of NOAA Fisheries, the directors of the five Gulf state marine resource management agencies and eleven additional members who are nominated by the state governors and appointed by the Secretary of Commerce. In addition, there are four nonvoting members representing the U.S. Coast Guard (USCG), U.S. Fish and Wildlife Service (USFWS), Department of State, and GSMFC. GMFMC meets five times a year at various locations around the Gulf coast. Proposed rule changes are then submitted to NOAA Fisheries for further review and approval before implementation.

Additionally, Louisiana is a member of the GSMFC, which was established by Congress in 1949 (P.L. 81-66) as a compact of the five U.S. Gulf states.[4] GSMFC is charged with promoting "better utilization of the fisheries, marine, shell and anadromous, of the seaboard of the Gulf of Mexico, by the development of a joint program for the promotion and protection of such fisheries and the prevention of the physical waste of the fisheries from any cause." Three representatives from each of the five Gulf states sit on the Commission, including the head of each state's marine resource agency, a member of the legislature, and a citizen with knowledge of marine fisheries.[5] The Commission makes recommendations regarding the management of the fisheries to the governors and legislatures of the five Gulf states. These recommendations are based on scientific studies made by experts from both state and federal resource agencies, and on advice from law enforcement officials and representatives from the commercial and recreational fishing industries.

<u>International:</u>
There is a shrimp fishery prosecuted in Mexican waters in the Gulf of Mexico that harvests the same species (*Farfantepenaeus aztecus* and *Litopenaeus setiferus)*, but no formal management body exists across international boundaries in the Gulf of Mexico.[6] The U.S. and Mexico do collaborate on fishery management issues through the United States-Mexico Fisheries Cooperation Program, which is a bilateral consultative agreement that was informally agreed upon by the U.S National Marine Fisheries Service (NOAA Fisheries) and the Mexican Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación (SAGARPA) in 1983.[7] Three memoranda of understanding (MOU) have been formalized through this relationship including the MEXUS-Golfo research program. Fishery Cooperation Talks (FCT) between NMFS and Mexico's National Commission of Aquaculture and Fishing (CONAPESCA) occur annually and MEXUS-Golfo working groups are held as needed. Recent FCT meetings have included discussion of sustainable fisheries management, protection and conservation of species such as sea turtles,

enforcement cooperation, aquaculture, collaborative research and participation in fisheries related international organizations.[8] For the purposes of management and assessments of shrimp, no detailed information is available for shrimp caught and and/or landed in Mexico; therefore, the Gulf of Mexico shrimp stocks are considered from the Mexican border to Florida and assessed accordingly. The SEFSC Galveston Lab shrimp research program includes an 'Information Transfer for Shrimp Fisheries' project. This project includes communications with Mexico Fishery Laboratories to enhance data collection and promote global stewardship of resources.[9]		

[1] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.13 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[2] Bourgeois et al., 2015 p.23

[3] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[4] *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[5] "Commissioners List" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/#:content@10:links@11

[6] FAO. "Shrimp fishing in Mexico" Global Study of Shrimp Fisheries. ftp://ftp.fao.org/docrep/fao/011/i0300e/i0300e02b.pdf

[7] Secretaria de Agricultura, Ganaderia, Desaorrollo rural, Pesca y Alimentacion (SAGARPA), 2012. Diario Oficial, Segunda sección, 24 de agosto de 2012. Actualización de la Carta Nacional Pesquera, 236 pp. http://www.inapesca.gob.mx/portal/documentos/publicaciones/CARTA%20NACIONAL%20PESQUERA/24082012%20SAGARPA.pdf

[8] NOAA. 2014. International Agreements Concerning Living Marine Resources of Interest to NOAA Fisheries. http://www.nmfs.noaa.gov/ia/intlagree/docs/2012/international_agreements.pdf

[9] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

7.1.3 (b) Is there a formal fishery commission or arrangement to which all parties fishing belong?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
The GMFMC was established under the MSA for the management of fisheries in the U.S. EEZ.[1] This area begins where state waters end and extends out to the 200 nautical mile limit of the Gulf of Mexico. GMFMC consists of 17 voting members and four nonvoting members. GMFMC voting members consist of the Southeast Regional Administrator of the NOAA Fisheries, directors of the Gulf states' marine resource management agencies, nominees and appointees from state governors and the Secretary of Commerce. Nonvoting members consist of representatives from the USCG, U.S. Fish & Wildlife Service (USFWS), Department of State, and the		

GSMFC.[2] The GSMFC is a regional body made up of representatives from each of the five U.S. Gulf states to address state fisheries cooperation and fisheries that span state and federal boundaries. It is made up of 15 Commissioners, three from each Gulf state, who provide direction for policies, projects and associated budgets. One-third are appointed by the state legislatures, one-third are private citizens appointed by states' governors, and the remaining voting members are state fishery resource agency directors. Meeting locations and appointed officers rotate among the states so as to better represent the fisheries and coastal areas of the entire Gulf of Mexico.[3] Gulf fisheries are also managed through multiple sectors within NOAA Fisheries, all of which rely on cooperation and coordination with each Gulf state. NOAA Fisheries Gulf Branch within the SERO works with GMFMC to develop FMPs, implements regulations, guides fishery management measures, and coordinates public review and comment periods.[4] The NOAA SEFSC manages multiple species in the Gulf, including shrimp.[5] NOAA SEFSC collects, analyzes, and manages both economic and biological data for Gulf shrimp species.[6] SEFSC is tasked with managing the GSS, a shrimp data program specifically engaged in collecting statistical data from commercial harvesters.[7] The Galveston Laboratory assists NOAA SEFSC with shrimp research and management. The Galveston Laboratory is a research facility that assesses, manages, maintains and enhances Gulf fishery stocks. It specifically monitors Gulf shrimp stocks (and evaluates their impact on other fisheries) and provides shrimp data to reduce uncertainty in the fishery management plan process.[8] While Gulf states are not members of the branches of NOAA Fisheries, their cooperation and coordination are heavily relied upon.[9]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[3] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/#:content@10:links@11

[4] "Gulf of Mexico Fisheries" *NOAA Fisheries Southeast Regional Office.* Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/

[5] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[6] "Shrimp Researched & Managed by the SEFSC" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/shrimp/

[7] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[8] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[9] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

7.1.4 Do States which have a real interest in the fisheries or the resource outside their jurisdiction cooperate in the work of the relevant regional fisheries management organization or arrangement by becoming a member of such organization and arrangement and by actively participating in its work? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Each Gulf State is represented as Voting Members on the GMFMC, which prepares FMPs to manage fishery resources in the Gulf's EEZ.[1] Aside from their role as Voting Members, individual state agents may be called upon by GMFMC to serve on panels and committees.[1] State agencies that work in coordination with GMFMC are the Alabama Department of Conservation and Natural Resources Division, Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, Louisiana Department of Wildlife and Fisheries, Mississippi Department of Marine Resources, and Texas Parks and Wildlife Department.[2] Gulf fisheries are also managed through multiple sectors within NOAA Fisheries, all of which rely on data supplied by each Gulf state. NOAA Fisheries Gulf Branch within the SERO works with GMFMC to develop FMPs, implement regulations, guides fishery management measures, and coordinates public review and comment periods.[3] The NOAA SEFSC manages multiple species in the Gulf, including shrimp.[4] NOAA SEFSC collects, analyzes, and manages both economic and biological data for Gulf shrimp species.[5] SEFSC is tasked with managing the GSS, a shrimp data program specifically engaged in collecting statistical data from commercial harvesters through port agents.[6] The Galveston Laboratory assists NOAA SEFSC with shrimp research and management.[7] The Galveston Laboratory is a research facility that assesses, manages, maintains and enhances Gulf fishery stocks. It specifically monitors Gulf shrimp stocks (and evaluates their impact on other fisheries) and provides shrimp data to reduce uncertainty in the fishery management plan process. All five Gulf states contribute to this effort through NOAA Fisheries' port agent data collection system and observer programs.[8] **Gulf States:** The GSMFC is an organization of the five Gulf states that works together to conserve, develop, and fully utilize fishery resources.[9] Each Gulf state is represented equally as GSMFC Commissioners, which set policy, approve budgets, and direct GSMFC activities. GSMFC serves as a discussion center for marine resource issues, allowing states to voice concerns and opinions regarding fishery resource management. GSMFC also serves as an avenue for coordination of state and federal agency programs related to fishery management and decisions. **Louisiana:** Louisiana is a member of both GMFMC and GSMFC, and maintains representatives on subcommittees and advisory panels of each organization.[10,11] LDWF staff		

members also participate in research conducted by each organization, and LDWF provides fishery dependent data to NOAA Fisheries.[12]		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] "Links" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/links/index.php

[3] "Gulf of Mexico Fisheries" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/

[4] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[5] "Shrimp Researched & Managed by the SEFSC" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/shrimp/

[6] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[7] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[8] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[10] "Commissioners List" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/#:content@10:links@11

[11] "Committee Members" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/panels_committees/index.php

[12] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

7.1.4 (a) Do all parties attend meetings and collect data in the specified format?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Representatives from Louisiana (and other Gulf states) serve on GMFMC and its subcommittees.[1] GMFMC meets five times a year in full session and subcommittees meet as needed based on specific project requirements.[2] Through the management of NOAA Fisheries SEFSC and Galveston Laboratory, the GSS, established in 1960, is a thorough, consistent data collection system which has provided the NOAA Fisheries Galveston Laboratory scientists with statistical information needed to conduct assessments of the commercial shrimp fishery.[3] Port agents collect shrimp fishery data related to pounds of shrimp harvested, value of the catch, size composition, and fishing effort. Trip ticket data from each of the states		

are verified against port agent sampling data and integrated into the GSS. Port agents have collected these data for decades in a very similar format, allowing for consistent, reliable scientific analysis of the commercial shrimp fishery. Each Gulf State (including Louisiana) provides data to NOAA port agents in this specific format. This program monitors Gulf shrimp stocks (and evaluates their impact on other fisheries) and provides much needed data to reduce uncertainty in the fishery management plan process. The Galveston Laboratory utilizes port agent data to assist in numerous scientific projects associated with the Gulf shrimp fishery.

NOAA SEFSC also produces the Economics of the Federal Gulf Shrimp Fishery Annual Report. This document discusses shrimp landings, revenue, permits, vessel, and economic status of the shrimp fishery. This report is based on data collected through surveys from permit holding harvesters from across the Gulf states. Information gathered from this survey helps determine economic trends of the industry and helps understand the social and economic impacts regulation changes may have on the fishery and communities.[4]

NOAA Fisheries data are also gathered through observer programs. The Shrimp Bycatch Reduction Device Evaluation Research Program through the Galveston Lab is part of the National Observer Program run by NOAA.[5] This program consists of onboard monitoring and scientific data analysis. The Observer Program evaluates TEDs and BRDs and documents bycatch volume and species composition. The fishery Observer Program was established in 1987 and has helped provide data for evaluating the economic impact of TEDs and BRDs on the shrimping industry. All five Gulf states contribute to this effort.

Louisiana:

Representatives from Louisiana (and other Gulf states) also sit on the GSMFC and its advisory committees, attend full commission meetings twice annually, and frequent ad hoc committee meetings as needed.[6,7] LDWF staff participate in and provide data for the following GSMFC programs, among others:[8,9,10,11,12]

- Fisheries Information Network (FIN)
- Interjurisdictional Fisheries Program (IJF)
- Fisheries Economic Data Program
- Southeast Area Monitoring and Assessment Program (SEAMAP)

Each program works to standardize the format of the data collection process based on program needs and coordinates with state agencies and other partners to carry out that process. Due to the independent development of each state's scientific monitoring programs, some sampling methods are not fully standardized across the region; however, similarities in protocols and type of data collected allow for standardization.

GSMFC recently completed an inshore shrimp fleet data collection program within their Fisheries Economic Data Program to better understand economic performance of the inshore fishery and economic impacts of potential management changes. GSMFC collected data from inshore vessels throughout the five Gulf states. Data consisted of revenue, operating costs, annual expenditures, employment, and vessel

characteristics. This information was used to publish multiple reports regarding the economic characteristics of the shrimp industry.[13]		

[1] "Committee Members" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/panels_committees/index.php

[2] "Meetings" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/council_meetings/index.php

[3] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[4] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[7] "Commissioners List" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/#:content@10:links@11

[8] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[9] "Fisheries Information Network (FIN)" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/fin.php

[10] "Interjurisdictional Fisheries Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/ijf.php

[11] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[12] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[13] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

7.1.4 **(b)** Is the population analysis updated regularly and in cooperation by a scientific group?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries, tasked with conducting research on the Gulf shrimp fishery, analyzes shrimp populations regularly. The NOAA SEFSC manages multiple species in the Gulf and collects, analyzes, and manages both economic and biological data for Gulf shrimp species.[1] NOAA SEFSC is tasked with managing the GSS, a shrimp data program		

specifically engaged in collecting statistical data from commercial harvesters through port agents (see 7.1.4(a) for details). The Galveston Laboratory assists NOAA SEFSC with shrimp research and management by monitoring Gulf shrimp stocks (and evaluates their impact on other fisheries) and providing shrimp data to reduce uncertainty in the fishery management plan process.[2] The Galveston Laboratory assesses the shrimp stock by analyzing fishery dependent landings and independent catch statistics, evaluating FMPs and regulations, developing models to forecast future landings, and monitoring industrial activities which may adversely impact the shrimp stock. The Galveston Laboratory aims to meet the above stated goals, as well as evaluate shrimp fishery impacts on protected species and other fisheries. The Galveston Laboratory manages the GSS. Port agents collect data needed to complete stock assessment modeling and monitoring, analyze trends of EEZ closures, develop models to assess impacts of closure options, monitor shrimping effort trends and effects on non-target species, and develop ecosystem based fishery models.[3] NOAA fishery scientists have established five research projects that utilize port data to accomplish the objectives of the Shrimp Fishery Research Program:[4]

- Shrimp Management: The objective of this project is to determine federal management impacts on the fishery and evaluate alternative management regulations to potentially increase economic growth.
- Shrimp Stock Assessment: The objectives of this project are to monitor trends in the shrimp fishery, conduct annual stock assessments, evaluate management options, and develop more reliable stock assessment models.
- Information Transfer for Shrimp Fisheries: The objective of this project is to ensure that the best available scientific knowledge is available to fishery managers and decision makers, which is accomplished through data exchanges, meetings, workshops, symposia, cooperative research, and publications.
- Forecasting Shrimp Harvests: The objective of this project is to produce annual forecasts for brown shrimp harvests (Texas and Louisiana) and pink shrimp harvests (off Florida) to aid management agencies in adjusting measures throughout the year.
- Revision of Trophic Model of Assessment of Ecological Interactions Among Shrimp and Bottomfish Assemblages: The objective of this project is to update a trophic ecosystem model that is used in assessing the impacts of trawl bycatch mortalities on trophic structure/ecology, nutrient cycling, and fishery yields of shrimp and finfish.

In most cases, the stock assessment will be prepared by NOAA Fisheries assessment biologists; however, occasionally, the assessment may be prepared by a state agency or by a university or independent assessment biologist under contract to NOAA Fisheries or a state agency.[5] Stock assessments for popular shrimp species were recently completed in 2014 (including data through 2013).[6] The SSC, made up of experts and scientists, also advises GMFMC. SSC helps determine research priorities for GMFMC and submits these to NOAA SEFSC.[7]

Louisiana: Louisiana has not completed a quantitative stock assessment of shrimp in Louisiana waters since the stock is assessed regionally by NOAA for each shrimp species throughout its range. However, LDWF continually monitors shrimp populations through the fishery independent sampling program and fishery activities through the trip ticket program.[8] LDWF biologists conduct surveys each month to monitor shrimp growth, distribution and abundance. Several gear types are utilized including 6 foot trawls for shallow marsh habitats, 16 foot trawls in inshore open waters, and 20 foot trawls in outside waters in the Gulf of Mexico.[9] LDWF has standardized procedures and locations for sampling and additional sampling is added, as necessary, to closely monitor shrimp abundance when determining season opening and closing dates. Surveys include documentation of all species captured and hydrological conditions at each location.		

[1] "Shrimp Researched & Managed by the SEFSC" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/shrimp/

[2] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[3] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] NMFS. 2014 Status of U.S. Fisheries Stock Assessments and other Sources that support Status Determinations. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2014/stockassessments_2014_rtc.pdf

[7] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[8] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[9] LDWF. "Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs. June 2015"

7.1.4 (d) Are scientific recommendations of groups reflected in the regulations?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC maintains a Standing SSC and Special SSC's for individual management units to provide scientific advice to the Council. The SSC is responsible for advising the Council on the adequacy of scientific information and analyses for proposed management measures and alternatives. The SSC reviews FMPs and amendments, including environmental impact statements (EIS), environmental assessments (EA), and regulatory impact reviews (RIRs) and provides a determination of whether these are based on the best scientific evidence available. Additionally, NS1 mandates that annual catch limits (ACLs) set by the Council cannot exceed the recommendations of the SSC.[1] The Shrimp FMP and amendments form the basis for the regulations that are promulgated through the Code of Federal Regulations (CFR) by NOAA Fisheries.[2] Title 50 of the CFR, Part 622, Subpart C contains the regulations for the shrimp fishery of the Gulf of Mexico.[3] These regulations reflect the scientific recommendations made through the GMFMC process. **Louisiana:** Louisiana regulations also reflect the scientific recommendations made by LDWF biologists, as well as recommendations by GMFMC and GSMFC. Dates for shrimp fishery seasons within Louisiana waters are highly flexible and are determined based on the scientific data provided by resource surveys conducted in each coastal basin. This allows LDWF to protect juvenile shrimp until they have reached a marketable size, and allowing for reproduction before entering the fishery. Other regulations for the inshore shrimp fishery include area closures to protect critical habitat, as recommended by GMFMC, and gear restrictions to reduce impacts to habitat and the ecosystem.[4]		

[1] GMFMC, 2012. Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[3] 50 CFR §622 http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.1.4 (e) Are the regulations respected by the parties concerned? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Regulations promulgated through the Code of Federal Regulations (CFR) are		

required by law for all participants fishing in the U.S. EEZ and are enforced by NOAA Fisheries Law Enforcement and the USCG Living Marine Resources division.[1,2,3] Regulations made by GMFMC are respected by the individual states and state regulations for territorial waters are generally consistent with federal regulations.[4] Each of the five Gulf states has a Joint Enforcement Agreement (JEA) with NOAA Fisheries through the Cooperative Enforcement Program which allows U.S. state conservation law enforcement officers to enforce federal laws and regulations pertaining to marine resources and endangered species.[5]		

[1] 50 CFR §622 http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[4] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[5] "Cooperative Enforcement Programs" *NOAA Fisheries.* Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/about/our_programs/cooperative.html

7.1.6 (a) Should representatives from relevant organizations, both governmental and non-governmental, concerned with fisheries be afforded the opportunity to take part in meetings of subregional and regional fisheries management organizations and arrangements as observers or otherwise, in accordance with the procedures of the organization or arrangement concerned?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
GMFMC meetings are open to public and allow public comment periods.[1] Meeting dates, locations and agendas are publicized prior to the meeting date. The GMFMC also holds public hearings throughout the region when specific rule changes are proposed. These meetings are also made available through webinar access on the Council website.[2] GSMFC meetings are also open to the public and allow public comment periods. Meeting dates, locations and agendas can be found on the GSMFC website.[3]		

[1] "Meetings" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/council_meetings/index.php

[2] "Watch our meetings live" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/council_meetings/Webinars.php?utm_source=Standing+and+Special+SSC+Meeting+8%2F14&utm_campaign=SSC+8-14&utm_medium=email

[3] *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

7.1.6 (b) Subject to the procedural rules on access, are such representatives given timely access to the records and reports of such meetings? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
The GMFMC meeting agendas, meeting minutes, transcripts, scientific reports and other publications are made available online through their website and are also available in writing through public records requests.[1] The GMFMC also provides briefing materials through their website for committee members and general public to access prior to each meeting.[2] Timelines vary for documents posted in briefing folders depending upon the project but are typically posted a few weeks prior to the meeting for documents being referenced. Meeting minutes from the most recent prior council meeting appear in the briefing folder for the next upcoming council meeting (council meetings occur five times a year and generally fall about two months apart.) GSMFC publishes reports and assessments as soon as possible once approved by the Commission. These reports are posted online in the publications area of the GSMFC website.[3] Notification of availability is sent to newspapers and local media and posted on GSMFC and state agency web pages and is announced in the GSMFC quarterly newsletter. Meeting minutes and records are compiled into a 'draft minutes book' twice a year after both the Spring and Fall annual meetings and sent to the Commissioners and meeting participants within 2-3 months. All GSMFC meeting minutes are collated by year and published annually on the website. Documents that are not immediately available on the website can be requested directly from GSMFC and are typically provided within one week of the request.		

[1] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[2] "Council Meeting Briefing Books" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/council_meeting_briefing_books.php

[3] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

7.1.7 (a) Have mechanisms been established for fisheries monitoring, surveillance, control and enforcement to ensure compliance with their conservation and management measures for the fishery in question? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
MONITORING: Federal: The SEFSC Fisheries Monitoring Branch monitors the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[1] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency's trip ticket reporting		

program. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico (see 7.1.4(a) for details on GSS).[2] Furthermore, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. Two separate databases are maintained for 1) port agent and dealer reported data and 2) fishermen reported data.[3] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program.

The ELB program began in 2007 and between 2007 and 2013, NOAA Fisheries funded and collected data on approximately 500 shrimp vessels through the program.[4] The ELB program collects data on amount and location of shrimp landings. This allows both fishing effort and catch-per-unit effort to be estimated for various shrimping locations, time periods, and vessels. Data from this program is also utilized to generate mortality estimates for a number of bycatch species including red snapper, and to monitor the number of incidental sea turtle takes. In 2014, improvements in technology prompted the program to change format to a cELB program. Utilizing cellular data networks, data are now automatically uploaded and transmitted to the Galveston Laboratory once the vessel is within cellular range. The program continues to use a stratified random sampling method to select participants each year with coverage on approximately one third of the fleet at any given time. If selected, Gulf shrimp permit holders are required to participate in the program and permit renewal is contingent upon participation.

Gulf shrimp permit holders are also required to carry an observer if selected for the Observer Program run by the Galveston Laboratory. Similar to the ELB program, permit holders are selected by the Southeast Regional Director through a stratified random sampling method. The focus of data collection for the Observer Program for the shrimp fishery is bycatch and BRD evaluation.[5,6] 50 CFR 622.52 requires any vessel with a Gulf commercial shrimp vessel permit, if selected by the SRD, to carry a NOAA Fisheries-approved observer and allow the observer free and unobstructed access to the vessel's bridge, working decks, holding bins, weight scales, holds, and any other spaces used to hold, process, weigh or store fish.[7]

50 CFR 622.51 requires the following reporting activities for the Gulf of Mexico shrimp fishery:[8]

1- General Reporting: commercial vessel owners and operators are required to provide information for any fishing trip, when requested by the SEFSC Science and Research Director (SRD), including vessel identification, gear, effort, amount of shrimp caught by species, shrimp condition, fishing areas and depths, and person to whom sold.
2- Electronic Logbook Reporting: vessel owners with a federal Gulf shrimp commercial vessel permit may be selected by the SRD and must participate in the electronic logbook reporting program sponsored by NOAA Fisheries. Compliance with these reporting requirements is required for permit renewal.
3- Vessel and Gear Characterization Form: all vessel owners/operators must complete an annual Gulf Shrimp Vessel and Gear Characterization Form

when applying for permit renewal. Compliance with these reporting requirements is required for permit renewal.

4- ALF: the owner/operator of a Gulf commercial shrimp vessel with a federal permit must annually report the vessel's total annual landings of shrimp. Required data includes total pounds, condition, and ex-vessel value for each species landed at Gulf of Mexico ports (regardless of catch location). These data are collected annually from all permit holders using the ALF and compliance with these reporting requirements is required for permit renewal.

5- Gulf shrimp dealers: a person who purchases shrimp from a vessel, or person, that fishes for shrimp in the Gulf EEZ or adjoining state waters, or lands shrimp in an adjoining state must provide the following information upon request by the SRD:

   a. Name and number of vessel from which the shrimp was received
   b. Amount of shrimp received, by species and size category for each receipt
   c. Ex-vessel value, by species and size category, for each receipt

NOAA Fishery-Independent resource surveys are conducted through the SEFSC Mississippi Labs. Shrimp/Bottomfish surveys are conducted each Fall and Summer, which are designed to provide a time-series for monitoring trends in resource abundance.[9] Surveys conducted by NOAA are part of the SEAMAP regional sampling program, coordinated through GSMFC, providing fishery independent data to enhance scientific evidence used in management decisions.[10] The Summer and Fall SEAMAP Shrimp/Groundfish Surveys are designed to monitor size, abundance and distribution of demersal species, including penaeid shrimp in the Northern Gulf of Mexico from inshore waters out to 60 fathoms.[11] Sampling is conducted across all five Gulf states using standardized methodologies and records data on all species caught and environmental parameters at each sampling site. All data from SEAMAP surveys is entered into the SEAMAP Information System, which contains a consistent dataset starting in 1982, and data are available to all participating agencies and to the public upon request.

Louisiana:

LDWF maintains monitoring programs for both fishery-dependent and fishery-independent data collection.

The fishery independent monitoring program in Louisiana was initially developed based on the methodologies utilized by the Cooperative Gulf of Mexico Estuarine Inventory and Study (GMEI) conducted in cooperation with the GSMFC.[12] The standardized methods and procedures of GMEI were developed by the GSMFC Technical Coordinating Committee (TCC). Historically, the Louisiana coast has been divided into seven Coastal Study Areas (CSAs) for monitoring purposes. The Louisiana CSAs were established in 1966 with funding from the federal Commercial Fisheries Research and Development Act, which funded the GMEI program. In 2010, sampling locations were revised due to changes in Louisiana's coastline from land loss and methodologies were altered to include a stratified random design to improve sampling coverage. Also, the historical CSAs were modified into five hydrological basins for monitoring activities.[13] Regular sampling occurs monthly with

additional sampling added during priority seasons. The database of trawl sampling for shrimp by the Marine Fisheries Section dates back to the 1960s. Standardized sampling protocols are documented in a Sampling Procedures Manual utilized by LDWF personnel.[14] Louisiana also participates in the SEAMAP regional sampling programs.

Fishery dependent data are gathered and monitored through the trip ticket program, which was implemented in Louisiana in 1999.[15] In May 2000 an electronic trip ticket component was added to increase efficiency and improve data collection. The trip ticket program requires reporting by all wholesale/retailer dealers and fresh products license holders that purchase fish directly from a commercial fishermen. Reports are completed on a per trip basis and submitted monthly to LDWF. Required data on each trip ticket form includes: commercial fisherman's name, license number and vessel number; area fished; gear used; date and length of trip (hours); dealer's name and license number; and species name, quantity, value, condition, and market count/size. This is consistent with the data collection requirements of the trip ticket programs used by the other four Gulf states and regional trip ticket data collection is coordinated through GSMFC.[16]

CONTROL:

Federal:

The Gulf of Mexico shrimp fishery is managed by the GMFMC and NOAA Fisheries and has regulations in place for entry into the fishery, methods of take, seasonal and area closures and gear requirements.

Federal regulations promulgated through 50 CFR 622 include:[17]

- Moratorium permits required. Any vessel fishing for shrimp in the Gulf of Mexico EEZ must have been issued a moratorium permit. No new permits have been added to the fishery since 2005. Permits may be transferred. Permits not renewed are terminated and can no longer be issued.
- Permit renewals are contingent on compliance with all reporting requirements
- A NOAA certified (BRD) is required in each net that is rigged for fishing.
- Closure areas:
    - Texas Closure: from May 15-July 15 each year trawling is prohibited in the EZZ off Texas
    - Southwest Florida seasonal trawl closure from January 1through May 20 each year
    - The Tortugas Shrimp Sanctuary (off the Florida coast) is completely closed to trawling
    - Potential closures of the Gulf fishery, determined annually, based on the need for reduction in red snapper bycatch
    - Shrimp/stone crab separation zones to prevent gear conflicts between the two fisheries

Louisiana:

Louisiana has regulations in place for entry into the shrimp fishery, methods of take and required reporting of landings for all shrimping activities within state territorial waters. A commercial fisherman's license, and a gear license for each gear type utilized is required to participate in shrimping in Louisiana state waters. Resident and non-

resident licenses are available and may be purchased year-round.[18] Regulations on method of take for commercial, recreational, and live-bait shrimping are established by Louisiana Revised Statutes, Title 56 and the Louisiana Admin. Code Title 76. Current regulations include:[19]

- Minimum size limit for white shrimp (100 count/pound)
- Closed seasons (dates vary based on biological sampling and are set by LDWC annually)
- Closed areas (prohibited commercial fishing in NWRs, and in several WMAs managed by the state)
- Gear requirements:
    - size and number of nets per boat based on gear type and area
    - mesh size restrictions
    - TEDs requirements (see federal regulations)

SURVEILLANCE AND ENFORCEMENT:

Federal:

Enforcement of federal fishing regulations is coordinated through NOAA Fisheries Office of Law Enforcement (OLE) and occurs in partnership with the USCG and state agency law enforcement divisions.

NOAA Fisheries OLE plays a direct role in enforcing fishery regulations and protection of marine wildlife and habitat by enforcing domestic and international laws which are "designed to ensure these global resources are available for future generations."[20] NOAA agents and enforcement officers are responsible for ensuring compliance with national marine resource laws and take action if laws are violated. NOAA Fisheries Law Enforcement is responsible for enforcing laws and statutes that fall under the Magnuson-Stevens Fishery Conservation Act, the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Lacey Act and the National Marine Sanctuaries Act. NOAA Office of General Counsel is the civil prosecutor, and the U.S. Department of Justice and the U.S. Attorney's Office serve as legal advisors and prosecutorial partners in criminal cases. NOAA agents conduct patrols by air, land, and sea, board vessels, conduct investigations, and inspect processing facilities. NOAA also works closely with the USCG as the nation's leading maritime law enforcement agency and NOAA's main enforcement partner. The USCG is the only military organization within the Department of Homeland Security and is responsible for safeguarding U.S. maritime interests and environment.[21] The USCG is present on local, regional, national and international levels and is a significant tool to ensure maritime safety, security and environmental stewardship. The USCG is responsible for enforcing federal fisheries laws and regulations as well as marine safety and marine environmental protection laws. The Living Marine Resources division has three main priorities: [22]

1) preventing illegal foreign fishing operations from entering the U.S. EEZ,
2) enforcing domestic fisheries law, and
3) international fisheries agreement development and enforcement.

Louisiana:

The LDWF Law Enforcement Division (LDWF/LED) is responsible for enforcing

the laws and regulations of the state provided for in the Constitution of the State of Louisiana and Louisiana Revised Statutes. The Mission of the LDWF/LED is "to establish and maintain compliance through the execution and enforcement of laws, rules and regulations of the state relative to the management, conservation and protection of renewable natural wildlife and fisheries resources and relative to providing public safety on the state's waterways and lands for the continued use and enjoyment of current and future generations."[23] LDWF/LED ensures compliance with all commercial and recreational licensing and harvesting regulations for marine resources through regular patrols and investigations. Louisiana also has a JEA with NOAA and state agents enforce federal regulations pertaining to marine resources such as the MSA, the (ESA), the MMPA, and the Lacey Act.[24] Penalties for violations vary based on the severity and frequency of violations and may include fines, jail time, revoking fishing license, and seizure of property. LDWF/LED also works to increase awareness of regulations and protection of environmental resources through a variety of outreach activities and print materials.		

[1] "Fisheries Monitoring Branch" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/data/monitoring.htm

[2] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[3] 2010 Analysis of Gulf Shrimp Moratorium Permits, NOAA.

[4] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[5] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[6] "National Observer Program: Shrimp" *NOAA Office of Science and Technology*. Web. Accessed November 2015. https://www.st.nmfs.noaa.gov/observer-home/regions/southeast/shrimp

[7] 50 CFR §622.52 http://www.gpo.gov/fdsys/granule/CFR-2013-title50-vol12/CFR-2013-title50-vol12-sec622-52

[8] 50 CFR §622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[9] "Mississippi Labs: Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[10] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 15 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[11] "SEAMAP Gulf of Mexico Resource Surveys" *Southeast Area Monitoring and Assessment Program*. Web. Accessed Nov. 2015. http://www.gsmfc.org/seamap-gomrs.php

[12] SEDAR 27-RD-06 "Fishery Independent Sampling: Louisiana" Southeast Data, Assessment, and Review. http://sedarweb.org/docs/wsupp/S27_RD_06_LDWF_independent.pdf

[13] LDWF. *Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs*. June 2015

[14] LDWF. *Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs.* June 2015

[15] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

[16] Donaldson, D. 2004. Overview of State Trip Ticket Programs in Gulf of Mexico. SEDAR7-DW-20 http://sedarweb.org/docs/wpapers/SEDAR7_DW20.pdf

[17] 50 C.F.R. § 622 http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[18] "Commercial License Page" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/fishing/commercial-license

[19] "Shrimp Regulations" Louisiana Department of Wildlife and Fisheries. Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/fishing/shrimp-1

[20] "Enforcement" *NOAA Office of General Council*. Web. Accessed June 2015. http://www.gc.noaa.gov/enforce-office.html

[21] *United States Coast Guard*. Web. Accessed June 2015. http://www.uscg.mil/top/about/

[22] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[23] LDWF. *Louisiana Department of Wildlife and Fisheries Strategic Plan 2014-15 through 2018-19*. July 2013. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/32540-about-ldwf/strategicplanjuly2013.pdf

[24] Bourgeois, 2015. p. 63

7.1.7 (b) Have these measures proved effective? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries OLE produces Quarterly reports by region to report on enforcement activities. Reports include details on violations issues under each federal act enforced by NOAA agents and activities of each of the JEAs for states within that region. The FY15 First Quarter Report reflects active monitoring of fisheries in the Southeast Division with 58 total incidents including 25 incidents reported in violation of the MSA, four incidents of the ESA, ten incidents of the Marine Mammal Protection Act.[1] OLE also maintains a current listing of enforcement actions on its website, and an archived listing of enforcement news reporting OLE program activities.[2,3] The Annual Review of the United States Coast Guard's Mission Performance (2013) report provides details of USCG activities for each division, including marine living		

resources.[4] According to this report, USCG spent 93,004 resource hours on living marine resources activities and compliance with fishing regulations remains above 97% (see chart below).

Performance Measures and Results: The USCG uses the percentage of fishing vessels observed at sea complying with domestic regulations as a measure of its impact on enforcement of U.S. fisheries and protected species regulations. The measure reflects the percentage of USCG boardings at sea where no significant violations of domestic living marine resources regulations were detected. As shown in the following chart, the USCG reported that it met its fishing regulation compliance rate living marine resources performance measure in FY 2013.

Living Marine Resources			
Performance Measure – Fishing Regulation Compliance Rate			
FY 2011 Actual	FY 2012 Actual	FY 2013 Target	FY 2013 Actual
97.4%	98.3%	96%	98.1%
√ Met	√ Met		√ Met

Source: DHS OIG based on USCG-provided data.

Louisiana:

LDWF Annual Reports reflect successes of the LDWF/LED including statistics on hours and areas patrolled, number of interactions with the public and number of violations cited. In FY 2013-14, LDWF/LED conducted over 292,000 patrol hours, of which 207,510 were land-based and 84,521 were on the water. There were 732,881 documented contacts by agents with the public and agents issued 12,551 criminal citations and 5,020 warnings.[5] The most common types of citations were fishing without a license, failure to comply with personal flotation device requirements, not abiding by rules and regulations on WMAs, and failure to comply with harvest record regulations.

The Louisiana STF website contains an LDWF Enforcement Report with statistics specific to shrimp violations. Between 2002-2012, the number of shrimp violations ranged from 69 to 206 per year, with an average of 137 violations per year and the most common violations included:[6]

1) Trawling in Closed Season (Inside Waters),
2) Butterflying in Closed Season
3) Use Skimmers in Closed Season,
4) Use shrimp net closed waters (specify area and net),
5) Take and possess shrimp in state waters closed season.

[1] NOAA Fisheries. *Office of Law Enforcement FY15 First Quarter Enforcement Report*. July 2013. http://safmc.net/sites/default/files/Regulations/pdf/NOAAOLE_Q1_2015_PublicReport_Final.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "News Archive" *NOAA Fisheries Office of Law Enforcement.* Web. Accessed June 2015. http://www.nmfs.noaa.gov/ole/newsroom/08_news_archive.html

[4] Department of Homeland Security, Office of Inspector General. *The Annual Review of the United States Coast Guard's Mission Performance (2013)*. OIG-14-140. September 2014.
https://www.oig.dhs.gov/assets/Mgmt/2014/OIG_14-140_Sep14.pdf

[5] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

[6] LDWF. *Enforcement Report*. August 2013.
http://www.wlf.louisiana.gov/sites/default/files/pdf/document/36907-louisiana-shrimp-fishery-improvement-plan-ldwf-enforcement-report/enforcement_report-final_8-1-13.pdf

7.1.8 (a) Have mechanisms been established to (identify, quantify) prevent or eliminate excess fishing capacity? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
	Federal: Kirkely et al. (2006) includes an analysis of the Gulf of Mexico shrimp fishery to determine the level of overcapacity and costs associated with reducing overcapacity within the fleet. This analysis utilized the average annual yield of shrimp between 1981 and 2001 (101.6 million pounds) as an equivalent to MSY, and used this as the target level in determining the overcapacity of the fishery.[1] The fishery was broken down into subgroups; capacity was determined for each division and then extrapolated to estimate total fleet level activity. Amendment 13 of the Gulf of Mexico Shrimp FMP (2005) established a 10-year moratorium on the issuance of commercial shrimp vessel permits capping the number of vessels in the federal fishery.[2] Amendment 13 notes that the fishery has remained above overfishing and overfished definitions since those definitions were established and current capacity is not a threat to the resource; however, economically the fishery has been operating at a negative profit margin, and a fewer number of vessels in the fishery would allow more profitable harvest of available shrimp resources. Amendment 13 also notes that, due to competition with foreign imports and rising fuel costs, the number of vessels in the fleet has declined and was expected to continue to decline until approximately 2012 when the number of participants reached a more profitable level. Since the implementation of the moratorium, license numbers have been reduced from 1933 permits in 2007 to 1470 permits in 2014, primarily due to economic losses in the fishery. The 10-year moratorium put in place by Amendment 13 expires in December of 2016 and the GMFMC is currently in discussions on the development of Amendment 17 to determine if the moratorium will expire, be extended, or development of a limited-access system will be put in place.[3] Amendment 17 has been divided into two separate draft amendments: 17A and 17B. Amendment 17A will determine whether the moratorium will be extended, which is currently the preferred option in place. Amendment 17B is currently working to address the appropriate number of permits for the fishery.[4] A number of issues have been identified in the current draft of Amendment 17B that must be addressed in order to determine the	

most appropriate action. First, the number of vessels in the fleet have continued to decline due to economic hardships and there is concern that this trend will continue indefinitely. Second, the current OY for the fishery is defined as equal to MSY, but MSY is calculated for each species individually, not for the fishery as a whole (combined penaeid species). The goal of Amendment 17B is to define optimal yield for the fishery and determine the appropriate number of permits for the fishery based on this updated information.

Louisiana:

There is currently no limit on the fishing capacity for the shrimp fishery in Louisiana state waters. A commercial fishing license is required which allows fishermen to harvest a variety of species and is not specific to shrimping. Gear licenses are required for each of the commercial shrimp gear types (shrimp trawl, skimmer net, butterfly net and cast net) and LDWF monitors fishing and gear license numbers annually.[5] The Louisiana Shrimp FMP notes that it is difficult to quantify the exact number of fishermen participating in the commercial shrimp fishery because gear licenses are transferrable; however, estimates can be made annually based on gear license numbers.[6] Additionally, analysis of trip ticket reports could also provide the total number of fishermen that report shrimp sales through the trip ticket program in any given year. The LA Shrimp FMP also notes that there is a large disparity between the number of gear licenses sold annually and the number of fishermen reporting shrimp catch. Anecdotal evidence suggests that many recreational fishermen purchase commercial gear and licenses yet only harvest shrimp for personal consumption or other recreational uses; however, the extent of this practice is currently unknown.

LDWF estimates based on gear licenses indicate that in 2000 and 2001, approximately 10,000 commercial fishermen held shrimp gear licenses.[7] This number steadily declined to a low of approximately 5,600 licensed shrimpers in 2008. Trip ticket reports indicate that about 7,000 harvesters reported shrimp sales in 2001, then number of harvesters reporting shrimp sales declined to a low of 2,912 in 2008.

The Louisiana Shrimp FMP stated objectives include "achieve a level of fishing capacity that provides for a sustainable level of harvest and allows for a profitable fishery."[8] Under the 'Current Issues and Management Options' section, the authors note that the Louisiana shrimp fishery is currently an open access fishery and thought current economic conditions have resulted in lower participation in the fishery, the potential does exist for rapid expansion in the future that may have negative outcomes.[9] Options to address effort management are provided; however, currently there is no definition of excess capacity and no action has been taken to limit capacity.

[1] James E. Kirkley, John M. Ward, James Nance, Frank Patella, Karyl Brewster-Geisz, Chris Rogers, Eric Thunberg, John Walden, Will Daspit, Brad Stenberg, Steve Freese, Jim Hastie, Stephen Holiman, and, Mike Travis, 2006. *Reducing Capacity in U.S. Fisheries*. NOAA Technical Memorandum NMFS-F/SPO-76. http://spo.nmfs.noaa.gov/tm/tm76.pdf

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[4] GMFMC. *Draft options for Amendment 17B of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-%205%20Shrimp%2017b-%20OY%20and%20Permit%20Pool.pdf

[5] "Commercial Shrimp License Requirements" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[6] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 27 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[7] Bourgeois et al., 2015, p. 28

[8] Bourgeois et al., 2015, p. 8

[9] Bourgeois et al., 2015, p. 67

7.1.8 (b) Have these measures proved effective? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
	Federal: The moratorium put in place by Amendment 13 capped the number of licenses in the fishery to the number of qualifying permits that were issued in the first year of the moratorium: 1,933 permits. Since 2007, permit numbers have decreased to 1470 permits in 2014 through termination of permits that were not renewed by the permit holder.[1,2] **Louisiana:** The Louisiana shrimp fishery is an open access fishery. Since there is no capacity reduction system in place, measures cannot be considered effective. Poor economic conditions of the fishery over the last decade have reduced the number of participants in the fishery; however, the Louisiana Shrimp FMP notes that the potential exists for rapid expansion of the fishery in the future if economic conditions improve.[3] The Louisiana Shrimp FMP contains a section under "Current Issues and Management Options" on effort management, which includes options to evaluate the shrimp fishery capacity and potential methods to limit effort; however, no actions have been agreed to at the time this report was written.	

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[3] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 67
http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.1.9 Are the arrangements followed for assessment, management of the fishery and the decision-making process in general transparent?

(i) - Assessment ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: The GMFMC observes the utmost transparency with regard to their FMPs and amendments via their website, open meetings, and public comment policies. While GMFMC plays a major role in the management of the Gulf shrimp fishery, it relies heavily on assessment data from NOAA Fisheries. NOAA Fisheries is responsible for assessing and managing Gulf shrimp fisheries.[1] Gulf shrimp stock assessments are conducted annually by NOAA Fisheries SEFSC Galveston Laboratory. To perform these stock assessments, NOAA Fisheries utilizes data from port agents, state trip ticket programs, electronic logbooks (ELB) and observer programs. Information about this data gathering process is published on the Galveston Laboratory's website.[2] While the actual data are not published, permit holders and vessel operators can request copies of their cELB GPS data. These data, while not available to the public, is used by GMFMC and NOAA Fisheries to assess the status of Gulf shrimp stocks which aids in the management of the fishery.[3] NOAA Fisheries SERO website contains the Gulf of Mexico Shrimp FMP and each amendment.[4] NOAA SEFSC publishes the Economics of the Federal Gulf Shrimp Fishery Annual Report on their website, supplying the public with the most recent assessments of the financial and economic status of the fishery.[5] Stock assessments for penaeid shrimp species are conducted annually and reviewed by the GMFMC SSC and Standing Shrimp SSC for approval, the most recent assessments completed in 2014 and are posted on the Galveston Lab website.[6] **Gulf States:** The GSMFC also plays a role in the Gulf shrimp fishery's assessment process, and does so transparently. GSMFC organizes state supplied data to create regional reports. Once approved by their Commission, GSMFC publishes reports in the publications area of their website.[7] Notification of availability is sent to newspapers and local media as well as posted on GSMFC and state agency social media and web pages.[8] GSMFC assessment programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[9,10] SEAMAP Gulf of Mexico Resource Surveys assess the shrimp fishery through the Summer and Fall Shrimp/Groundfish Surveys. The Fisheries Economic Data Program published peer-reviewed economic reports in 2014.[11,12] These reports assessed the economic landscape of the shrimp industry, providing revenue, operating cost, annual expenditure, employment, and		

harvesting/harvester data. Both the SEAMAP and the Fisheries Economic Data Program examples follow the transparency and publication practices of GSMFC. **Louisiana:** The LWFC and the LDWF are responsible for managing the shrimp fisheries in state waters of Louisiana. As government bodies, LDWF and LWFC adhere to the Louisiana Open Meetings Law.[13] LDWF Fisheries Division conducts biological sampling regularly, with increased frequency during crucial periods near the start of shrimp seasons and sampling results are presented to the STF and the LWFC during public meetings. Sampling results provide the scientific evidence for management decisions that determine the opening and closing of shrimp seasons within state waters. Other assessments of the shrimp fishery including economics reports, and industry surveys are also presented to the STF during public meetings and research results are posted on the LDWF website. LDWF has also published a Louisiana Shrimp FMP, which is publically available on the LDWF website and contains information on assessment procedures and results of recent analyses of the fishery.[14]		

[1] *FishWatch*. Web. Accessed November 2015. http://www.fishwatch.gov/

[2] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[3] "SPGM Electronic Log Book" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/

[4] "Gulf of Mexico Shrimp Rulemakings" *NOAA Fisheries Southeast Regional Office.* Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/rules/gulf/shrimp/index.html

[5] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[6] NMFS. 2014 Status of U.S. Fisheries Stock Assessments and other Sources that support Status Determinations. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2014/stockassessments_2014_rtc.pdf

[7] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[8] "Recent News from the Gulf States" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/news.php

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[10] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[11] Miller, Alexander, Maryam Tabarestani, and Jack Isaacs. 2014. *A Survey of Recreational Shrimpers in the Northern U.S. Gulf of Mexico*. Gulf States Marine Fisheries Commission Publication, Publication Number 228. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20228.pdf

[12] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[13] La. R.S. 42:12-28 (Open Meetings Law) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[14] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.1.9 (ii) - Management ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: GMFMC manages the Gulf shrimp fishery resources through the Shrimp FMP. This plan, implemented as federal regulation in 1981, is available to the public along with all amendments via the GMFMC website.[1] These amendments are the result of a transparent five step process that includes scoping, public hearings, final action, rule making and implementation.[2] GMFMC meetings are open to the public and allow for public comment periods.[3] Meeting dates, locations and agendas are publicized prior to the meeting.[4] GMFMC also holds public hearings throughout the region when specific rule changes are proposed. These meetings are also made available through webinar access on the GMFMC website.[5] GMFMC meeting agendas, meeting minutes, transcripts, scientific reports and other publications are made available online through their websites and are also available in writing through public records requests.[6] GMFMC also provides briefing materials through their website for committee members and the general public to access prior to each meeting.[7] Timelines vary for documents posted in briefing folders depending upon the project but are typically posted a few weeks prior to the meeting. Meeting minutes from the most recent prior GMFMC meeting appear in the briefing folder for the next upcoming meeting (GMFMC meetings occur five times a year and generally fall about two months apart). NOAA Fisheries, along with GMFMC, is responsible for managing Gulf shrimp fisheries. Stock assessments are developed by the NOAA Fisheries Galveston Laboratory to aid in the management of the fishery and published on the lab website.[8] NOAA Fisheries publishes public comments on their website each month and all reports are publically accessible via their website. **Louisiana:** As a government bodies, LWFC and LDWF are subject to the Louisiana Open Meetings Law requiring transparency in how the they make management decisions.[9] LWFC meetings are open to the public, allow public comment, and transcripts are published after the meeting on the LDWF website.[10] The STF advices LWFC and LDWF on management decisions and also follows the Louisiana Open Meetings Law; therefore, all STF meetings are open to the public and meeting minutes and		

other STF documents are publically posted on the STF website.[11] Fishermen are active participants at LWFC and STF meetings and make public comment on proposed regulatory changes and other fishery-related matters. Public records are also available for all government bodies, including LDWF, as required by the Louisiana Revised Statutes, Title 44 (Public Records Law).[12] All laws relating to marine resource management in Louisiana are publically available online (Louisiana Revised Statutes, Title 56 and Louisiana Administrative Code, Title 76). Fishing regulations are also published in print and on the LDWF website. Public notification and participation throughout the decision-making process is required by the Louisiana Administrative Procedures Act (La R. S. 49) and encouraged by LDWF.[13] The Louisiana Administrative Procedures Act requires all proposed rules to be published in the *Louisiana Register* 100 days prior to taking action on any proposed rule, and requires that all interested persons are afforded a reasonable opportunity to provide comment on the rule, which the agency must consider as part of the decision-making process and must issue a response. The APA also requires that a fiscal impact and an economic impact statement be prepared for each proposed rule prior to action. LDWF and LDWC are granted specific permission by La. R.S. 49:953 to set separate timetables for adoption of rules for the setting of season dates for harvest of species under agency management.[14]		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] "Scoping through Implementation" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/scoping-thru-implementation.php

[3] "Meetings" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/council_meetings/index.php

[4] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[5] "Watch our meetings live" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/council_meetings/Webinars.php?utm_source=Standing+and+Special+SSC+Meeting+8%2F14&utm_campaign=SSC+8-14&utm_medium=email

[6] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[7] "Council Meeting Briefing Books" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/council_meeting_briefing_books.php

[8] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[9] La. R.S. 42:12-28 (Open Meetings Law) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[10] "Commission agendas" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commissionagenda1

[11] "Shrimp Task Force Meetings" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/meetings

[12] La. R.S. 44 (Public Records Law) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[13] La. R.S. 49:950 (Administrative Procedures Act) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[14] La. R.S. 49:953 https://legis.la.gov/Legis/Law.aspx?d=103789

7.1.9 (iii) - Decision-making ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: GMFMC and NOAA Fisheries observe the same transparency requirements in decision-making regarding public meeting information, proposed regulation changes, reports and assessments, and other shrimp fishery publications as detailed in the assessment and management sections above. **Louisiana:** LWFC and LDWF observe the same transparency requirements in decision-making regarding shrimp industry related activities as detailed in the assessment and management compliance sections above. **Gulf States:** GSMFC also observes the same transparency requirements detailed in the assessment section above. Additionally, a recently developed website sponsored by GSMFC, Gulf FINFO, contains information on the shrimp fisheries of the Gulf of Mexico, summarizing management practices, biological information, assessment and monitoring activities, and harvest data with links to population assessments and relevant documents.[1]		

[1] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Species?SpeciesID=102

7.1.10 Are the conservation and management measures adopted for management of the fishery and the related decision-making process given due publicity in order to ensure that laws, regulations and other legal rules governing their implementation are effectively disseminated?
Yes...[1] ***In part...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Aside from the actions listed above (see responses to 7.1.9), the GMFMC publishes regulations, management plans, amendments, scientific reports, meeting agendas, minutes, and transcripts on their website, ensuring regulatory information is effectively disseminated.[1,2] Prior to each meeting, briefing materials are made		

available online, allowing stakeholders to become familiar with subjects of interest.[3] The GMFMC website contains information regarding recent updates to Gulf fishery regulations, ensuring the public stays apprised of the latest legal rules governing the fishery.[4] GMFMC also communicates publicly via newsletters, social media posts, and cell phone applications, all in an effort to effectively disseminate conservation and management information.[5] NOAA Fisheries SERO posts updated links to published fishery bulletins seeking public comment on proposed fishery regulation changes.[6,7] Their website also contains a News Room link where the public may access recent media activity.[8] The NOAA Fisheries SEFSC website contains a publication database searchable by topic/species. Grants, research programs, technical reports, peer-reviewed publications, and initiatives may be searched through the publications database as well.[9] The SEFSC Library is also available to the public through the SEFSC website.[10] The SEFSC Galveston Laboratory website also publicizes recent press releases on their website and displays information and links regarding shrimp harvest forecasting reports and assessment information.[11,12] **<u>Gulf States:</u>** The GSMFC publishes reports and assessments as soon as possible once approved by the Commissioners. These reports are posted online in the publications area of the GSMFC website.[13] Notification of availability is sent to newspapers and local media as well as posted on GSMFC and state agency social media and web pages. Meeting minutes and records are compiled into a "draft minutes book" twice a year after both the Spring and Fall annual meetings and sent to the Commissioners and meeting participants within two to three months. All GSMFC meeting minutes are collated by year and published annually on the website.[14] Documents that are not immediately available on the website can be requested directly from GSMFC. GSMFC meetings are open to the public and allow for public comment periods. Meeting dates, locations and agendas can be found on the GSMFC website. **<u>Louisiana</u>:** Aside from the actions listed above (see response to 7.1.9) providing transparency throughout the decision-making process, LDWF takes several actions to ensure that adopted regulations are adequately publicized. LDWF posts all fishing regulations on the LDWF website and publishes the *Louisiana Commercial Fishing Regulations, 2015,* which is available in print.[15,16] LDWF also publishes news articles regularly and posts on social media to provide the public with information on LDWF activities and regulations pertaining to marine resources.[17,18]		

[1] "Meetings" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/council_meetings/index.php

[2] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[3] "Meetings" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/council_meetings/index.php

[4] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[5] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[6] "Fishery Bulletin Archives" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/bulletin_archives/index.html

[7] "Fishery Bulletins" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/index.html

[8] *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/index.html

[9] "Publications" *NOAA Fisheries Southeast Fisheries Sciences Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/publications/

[10] "Library" *NOAA Fisheries Southeast Fisheries Sciences Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/library/

[11] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[12] "Brown Shrimp Forecast 2015" *NOAA Fisheries Galveston Laboratory*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/stories/2015/Brown%20Shrimp%20Forecast/index.html

[13] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[14] "Meeting Minutes" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=MINUTES

[15] "Shrimp Regulations" Louisiana Department of Wildlife and Fisheries. Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/fishing/shrimp-1

[16] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[17] "Commercial Fishing Email and Text Notification" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/signup

[18] "News" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/news

7.2 Management objectives

7.2.1 (a) Are fisheries measures based on the best scientific evidence?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
The state and federal agencies (GMFMC, NOAA Fisheries, LWFC and LDWF)		

charged with management of shrimp in Louisiana and the Gulf of Mexico are mandated by laws to manage the fishery based on best available scientific evidence. These agencies work closely on research and monitoring and timely scientific information is provided to managers during the decision-making process. For further details on scientific programs and management measures, **refer to 7.1.1(a).**		

7.2.1 (b) Are they qualified by relevant environmental and economic factors?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
<u>Federal</u>: MSA NS1 requires the consideration of social, economic, and ecological factors in the determination of OY for the fishery.[1] To the extent possible, relevant social, economic, and ecological factors used should be quantified and must be specified when determining OY. An FMP must address each factor: social, economic, and ecological within the report. Amendment 13 of the Shrimp FMP contains a discussion of environmental and socioeconomic impacts in Actions 6 and 7 with regard to the setting of MSY and OY for the penaeid shrimp species.[2] Amendment 15 of the Shrimp FMP includes revisions to the SDC for the fishery and contains updated information on environmental and socioeconomic impacts.[3] The National Environmental Policy Act (NEPA) requires the analysis of any potentially significant environmental impacts that may result from new regulations or agency actions by all federal government agencies.[4] Section 304(i) of MSA requires compliance with NEPA regulations with regard to fishery management plans and actions.[5] NOAA Fisheries determines the analysis level necessary to comply with MSA and NEPA regulations for each FMP amendment and management action.[6] A summary of findings is compiled in either a Record of Decision or a Finding of No Significant Impact (FONSI) which is included in each FMP or amendment. For the Shrimp FMP, an EIS or an EA has been conducted for each amendment, as necessary.[7] The MSA (section 303 (a)(9)) requires that FMPs include a fishery impact statement (FIS) for the plan or amendment.[8] The FIS includes an assessment of the likely biological, social, economic, and administrative effects, if any, of the conservation and management measures on fishery participants and their communities as well as participants in other fisheries conducted in adjacent areas. NOAA Fisheries also requires an RIR for each regulatory action of public interest, which provides a review of the level and incidence of impacts associated with the action, a review of the problems and policies prompting the action, and ensures that the agency has comprehensively considered all alternatives.[9] **<u>Louisiana</u>:** Based on FAO guidelines, one typical method of addressing the broad economic context of a fishery is through consultation with legitimate users.[10] Louisiana		

maintains a STF composed of industry representatives, who meet regularly to address industry concerns and advise LDWF.[11] LDWF may also conduct scoping meetings, public hearings, and industry surveys to gain socioeconomic information and considers these factors in the decision-making process. The Louisiana Administrative Procedures Act also requires public participation in the LWFC and LDWF decision-making process.[12] The Louisiana Administrative Procedures Act (La. R.S. 49) requires the consideration of fiscal impacts and economic impacts when setting rules or making amendments to existing rules and fiscal and economic statements, or a statement of no impact, must be provided with the proposed rule.[13] LDWF Office of Fisheries contains a Socioeconomic Research and Development section which conducts research on the socioeconomics of important Louisiana and Gulf of Mexico fisheries to support resource management decisions. The Socioeconomic Research and Development Section utilizes data gathered through the trip ticket program and specialized surveys to evaluate the economic status of fisheries and the impacts of different regulatory actions. This research is published in LDWF FMPs, department reports and peer-reviewed scientific journals and is presented at scientific conferences and management meetings. The Louisiana Shrimp FMP contains the most recent socioeconomic research on the Louisiana shrimp fishery.[14] Louisiana addresses environmental factors through the biological sampling and assessment process. LDWF fishery independent monitoring program includes sampling of hydrological data at each site.[15] When setting dates for inside and outside shrimp seasons in Louisiana waters, LWFC considered all biological and environmental data provided from the monitoring program.[16] Sampling for shrimp annually and allowing flexible season opening dates set based on sampling data, LDWF accounts for the variability in environmental factors and their influence on shrimp stocks. The Louisiana Shrimp FMP contains a section on environmental factors influencing the shrimp fishery, noting that environmental conditions in shrimp nursery areas are a significant driver of shrimp growth and survival.[17]		

[1] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[4] "National Environmental Policy Act" *NOAA Office of Planning and Integration*. Web. Accessed November 2015. http://www.nepa.noaa.gov/

[5] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[6] "National Environmental Policy Act Requirements" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/msa/nepa.html

[7] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[8] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[9] "Guidance for Conducting Economic and Social Analyses of Regulatory Actions. *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/economic_social/index.html

[10] FAO. 2002. *A fishery manager's guidebook: Management measures and their application*. FAO Fisheries Technical Paper 424. Rome, Italy. http://www.fao.org/docrep/015/i0053e/i0053e.pdf

[11] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

[12] La. R.S. 49:950 (Administrative Procedures Act) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[13] La. R.S. 49:953 https://legis.la.gov/Legis/Law.aspx?d=103789

[14] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 16-39. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[15] LDWF. "Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs. June 2015"

[16] Bourgeois et al., 2015. p.59

[17] Bourgeois et al., 2015, p. 50

7.2.1 (c) Have formal reference point(s) based on stock size been established?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance	
Yes	**No**
Amendment 13 (2005) of the GMFMC Shrimp FMP originally defined the reference points for the Gulf of Mexico shrimp fishery. At the time, amendment 13 noted the following: *In accordance with the National Standards guidelines set by MSA, for annual stocks, like penaeid shrimp, it is appropriate to establish an MSY control rule based on maintaining a constant level of escapement (parent stock) each year that will produce sufficient recruits to maintain harvest at historic levels. This approach relates MSY in terms of catch to a quantifiable level of escapement in each stock, where a proxy for B_{MSY} is established as the minimum parent stock size known to have produced MSY the following year.*[1] Based on these guidelines, Amendment 13 established the following: The MSY values for the penaeid shrimp stocks fall within the range of values defined by the lowest and highest landings taken annually from 1990-2000 that does not result in recruitment overfishing as defined herein: - Brown shrimp: MSY is between 67,000,000 and 104,000,000 lbs. of tails - White shrimp: MSY is between 35,000,000 and 71,000,000 lbs. of tails The overfishing threshold is defined as a rate of fishing that results in the parent stock number being reduced below the MSY minimum levels listed below:	

- Brown shrimp- 125 million individuals, age 7+ months during the November through February period - White shrimp- 330 million individuals, age 7+ months during the May through August period An overfished condition would result when a parent stock number falls below one-half of the overfishing definition listed below. - Brown shrimp - 63 million individuals, age 7+ months during the November through February period - White shrimp - 165 million individuals, age 7+ months during the May through August period Due to recent updates in stock assessment modeling, stock assessments for shrimp are now being conducted with a new model. This model provides different outputs than the original stock assessment models used when the SDC for shrimp stocks was set in Amendment 13. In 2015, the SDC for the shrimp fishery were redefined, through Amendment 15 of the GMFMC Shrimp FMP as the following:[2] **MSY:** - **Brown shrimp: 146,923,100 pounds of tails** - **White shrimp: 89,436,907 pounds of tails** **Overfishing:** - **Brown shrimp: F_{MSY} 9.12** - **White shrimp: F_{MSY} 3.48** **Overfished:** - **Brown shrimp: SSB_{MSY} is 6,098,824 pounds of tails** - **White shrimp: SSB_{MSY} is 365,715,146 pounds of tails**	

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

7.2.2 Have management measures taken into account the need to avoid excess capacity and promote conditions under which the interests of fishermen, especially the small-scale, artisanal and subsistence fishery sectors, are protected, the biochemistry conserved, depleted stocks restored and adverse environmental impacts assessed and corrected?

7.2.2 (a)(i) - Is the level of excess capacity defined? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	<u>Federal</u>: The Gulf of Mexico shrimp fishery conducted in federal waters is managed by GMFMC and NOAA Fisheries under a federal shrimp permit moratorium system. Capacity of the federal fleet was analyzed in 2006 by Kirkely et al. in a larger study examining overcapacity in several U.S. fisheries.[1] Since that time, the Gulf of Mexico shrimp fishery has seen significant reductions in license numbers due to economic losses of the fishery. The current license moratorium for the federal fleet will expire in	

	2016. GMFMC and NOAA Fisheries are currently working to assess the capacity of the fishery and determine the appropriate number of permits through Amendments 17A and 17B.[2,3] For additional details, refer to 7.1.8(a). **Louisiana:** At the state level, there is currently no limit on the fishing capacity for the shrimp fishery in Louisiana waters and no definition has been established for excess capacity of this fishery. The Louisiana Shrimp FMP stated objectives include "achieve a level of fishing capacity that provides for a sustainable level of harvest and allows for a profitable fishery."[4] Under the 'Current Issues and Management Options' section, the authors note that the Louisiana shrimp fishery is currently an open access fishery and, though current economic conditions have resulted in lower participation in the fishery, the potential does exist for rapid expansion in the future that may have negative outcomes.[5] Options to address effort management are provided in the plan; however, currently optimal or excess capacity has not been defined, and no action has been taken to limit capacity in this fishery.	

[1] James E. Kirkley, John M. Ward, James Nance, Frank Patella, Karyl Brewster-Geisz, Chris Rogers, Eric Thunberg, John Walden, Will Daspit, Brad Stenberg, Steve Freese, Jim Hastie, Stephen Holiman, and, Mike Travis, 2006. *Reducing Capacity in U.S. Fisheries*. NOAA Technical Memorandum NMFS-F/SPO-76. http://spo.nmfs.noaa.gov/tm/tm76.pdf

[2] GMFMC. *Draft options for Amendment 17A of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-4PHDraftShrimp17A

[3] GMFMC. *Draft options for Amendment 17B of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-%205%20Shrimp%2017b-%20OY%20and%20Permit%20Pool.pdf

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.8. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[5] Bourgeois et al., 2015, p. 67

7.2.2 (a)(ii) - Is excess capacity avoided? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	Federal: The moratorium put in place by Amendment 13 capped the number of licenses in the fishery to the number of qualifying permits that were issued in the first year of the moratorium: 1,933 permits.[1] Since 2007, permit numbers have decreased to 1470 permits in 2014 through termination of permits that were not renewed by the permit holder.[2] GMFMC and NOAA Fisheries are currently reassessing the appropriate number of permits for the fishery through the Shrimp FMP Amendments 17A and B. **Louisiana:** Since there is no definition of excess capacity for the Louisiana shrimp fishery, it is not possible to determine if excess capacity has been avoided.	

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

7.2.2 (b) - Do the economic conditions under which the fishery operates promote responsible fisheries? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance
N/A
This question has been omitted from scoring.

7.2.2 (c) - Are interests of small-scale, etc., fishermen accounted for? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The original Shrimp FMP implemented in 1981 contains a socioeconomic characterization of the fishery.[1] Section 3.5.5 addressed subsistence fishing and determined that no individuals, communities or societies met the accepted definition; however, there may be some fishermen who partially subsist on shrimp. These fishermen typically fish under recreational permits. Section 3.5.6 addresses Native American rights to resources and traditional fishing practices and did not identify any persons or communities that would require consideration within the FMP. MSA NS4 and NS8 require an evaluation of fishing participants and communities within the fishery and mandates equitable distribution of resources and consideration of community reliance on resources when setting regulations:[2] *NS4: Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (a) fair and equitable to all such fishermen; (b) reasonably calculated to promote conservation; and (c) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privilege.* *NS8- Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.* Additionally, Executive Order 12898 directs federal agencies to identify and develop strategies to address the human health or environmental effects that agency actions may have when a disproportionately high and adverse effect on minority and low-income populations occurs.[3]		

Amendment 13 of the Shrimp FMP section 7.3.2 contains information on the social environment of the shrimp fishery and identifies communities within the Gulf of Mexico rely highly on the shrimp fishery.[4] Amendment 13 identifies 24 communities that are relatively vulnerable to social and economic impacts of management changes within the shrimp fishery and should be given additional consideration.

Louisiana:

There is no strict definition of "small-scale" or "artisanal" based on FAO guidelines or documents; however, there is agreement that these terms reference specific aspects of a fishery, such as size and scale of the fishery, its proximity to shore and duration of trip, use of technology, and individual ownership as opposed to businesses or corporations.[5] Based on these general guidelines, the shrimp fishery conducted within Louisiana state waters is largely comprised of small-scale fishermen with vessel sizes that are generally small in comparison to the larger, offshore fleets and fishers tend to work with few crewmembers, if any, to a boat.

The Louisiana Shrimp FMP contains a section titled "Description of the Fishery" which provides socioeconomic data on the fishery.[6] This section notes that the Louisiana shrimp fishery is nicknamed "the mosquito fleet" due to the high number of relatively small vessels participating in the fishery. The highest proportion of shrimp landings is made by vessel sizes ranging from 30-49 feet in length. Based on trip ticket data, vessel sizes range from under 19 feet in length to over 65 feet for offshore vessels. Analyzes of trips by length indicate that the majority of commercial shrimp fishing trips in Louisiana span less than 2 days. "The number of trips spanning less than two days represented more than 68 percent of total trips taken and accounted for 28 percent of average total landings."[7] This section also notes that many commercial fishermen within the shrimp industry land relatively low volumes of shrimp annually. Table 11 on page 31 of the Louisiana Shrimp FMP provides the number of commercial fishermen broken down by total annual landings (in pounds) in the following intervals: 0-999, 1K-5K, 5K-10K, 10K-20K, 20K-30K, 30K-40K, 40K-50K, 50K-100K, >100K. Fishermen with annual landings ranging from zero to 999 pounds of white and brown shrimp comprise the largest group of reporting commercial shrimp fishermen in Louisiana, and fishermen landing less than 5,000 pounds of white and brown shrimp comprise close to 50% of reporting fishermen.[8]

LDWF considers these factors when setting regulations for the inshore fishery and consults with industry representatives through the STF and public meetings to address these factors.[9,10] LDWF publicizes public meetings and comment periods for proposed management actions through the LDWF website and encourages public participation through these outlets.[11,12]

LDWF also issues recreational shrimp licenses for residents who harvest shrimp for personal consumption and Special Bait Dealer Permits for shrimpers who provide live shrimp for recreational fishing.[13,14] Shrimp caught under a recreational shrimp license may not be sold. Shrimp caught under a live-bait license must be kept alive onboard the vessel (will a maximum allowance of 2 gallons of dead catch) and operate under specific gear restrictions.

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] Executive Order 12898 http://www2.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice

[4] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[5] Fisheries and Aquaculture topics. Small-scale and artisanal fisheries. Topics Fact Sheets. Text by Jan Johnson. In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 27 May 2005. [Cited 11 August 2014]. http://www.fao.org/fishery/topic/14753/en

[6] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.21. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[7] Bourgeois et al., 2015, p. 28

[8] Bourgeois et al., 2015, Table 11 p. 31

[9] "Shrimp Task Force Meetings" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/meetings

[10] "Commission agendas" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commissionagenda1

[11] "Commission agendas" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commissionagenda1

[12] "Action Items" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/action-items

[13] "Recreational Shrimp Regulations" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.fishla.org/fishing/recreational-fishing-regulations/recreational-shrimping/

[14] "Live Bait Dealer Regulations" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/live-bait-shrimp

7.2.2 (d) - Has the biodiversity of aquatic ecosystems been conserved (as a result of operation of the fishery in question)? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	There are two overarching considerations for the Louisiana shrimp fishery with regard to conservation of biodiversity of ecosystems: bycatch and bottom habitat impacts.	

BYCATCH:

Bycatch is a major concern in shrimp fisheries globally. A FAO report on fishery discards (Kelleher 2005) indicates that, world-wide, shrimp trawl fisheries have both the highest discard rate and volume of all fisheries.[1] This report also notes that warm-water shrimp trawl fisheries typically have significantly higher proportions of bycatch (average: 75% of total catch), than cold-water fisheries (average: 10% of total catch). Environmental impacts associated with bycatch include depletion of species typically caught as bycatch, which may include species that are listed as protected, endangered, or threatened (PET), and alterations of the food web such as trophic cascades. Managers and shrimp fishermen throughout the Gulf of Mexico have cooperated to develop and utilize best-practices for bycatch reduction and have made substantial progress in minimizing bycatch impacts. Collaboration is ongoing to develop innovative methods to further address bycatch concerns. NOAA Fisheries National Bycatch Report acknowledges the improvements made to the Gulf of Mexico shrimp fishery and also provides suggestions for additional improvement.[2] Similarly, the Louisiana Shrimp FMP identifies general bycatch and incidental capture of sea turtles as ongoing issues in the fishery and presents options for management consideration.[3]

Trawling, in general, is not considered a selective form of fishing; however, the selectivity of trawls is dependent on a variety of factors including the type and size of trawls, modifications such as BRDs, geographic area fished, and regulations on how they are used. A recent report by the Sustainable Fisheries Partnership (SFP) on shrimp fisheries bycatch highlights the progress that the Gulf of Mexico shrimp fishery has made in recent years to substantially reduce bycatch including the required use of BRDS, TEDs, area closures, effort limitations, and gear restrictions such as configuration and size limits of trawls.[4] The SFP report notes that the Gulf of Mexico shrimp otter trawl fishery has received "low risk" scores for a majority of categories, with only a few "medium-risk' areas, and no "high-risk" ratings.

The initial NOAA National Bycatch Report, published in 2011, indicated that the fishery bycatch ratio (ratio of the total fishery bycatch to total fishery catch) for the Gulf of Mexico shrimp fishery was .76, the highest of all U.S. fisheries analyzed in the report (note: some fisheries were data-deficient and could not be included, such as the South Atlantic shrimp trawl fishery).[5] The 2013 update to the National Bycatch Report indicates that improvements in bycatch estimation and bycatch reduction in the Gulf of Mexico shrimp trawl fishery have resulted in a decrease of the fishery bycatch ratio from .76 to .63.[6] This report shows continued progress in efforts to reduce impacts of bycatch in the fishery; however, the shrimp fishery does still remain one of the highest bycatch fisheries in the U.S. The fishery bycatch ratio for all U.S. fisheries combined is .17. The National Bycatch Report includes a Bycatch Estimation Improvement Plan for the Gulf of Mexico shrimp trawl fishery with recommendations for the fishery.

Initial bycatch to shrimp ratio estimates for the Gulf of Mexico shrimp fishery from 1970s were approximately 10:1, with some estimates, based on season and area, as high as 13.7:1.[7] Since that time, the implementation of TEDs, BRDs, area closures

and significant reductions in shrimp effort have all contributed to substantial decrease in the bycatch of the fishery. Estimates in 2009 concluded that bycatch ratios had remained consistent at approximately 4:1 since 2000.[8] The 2012 report by Scott-Denton et al., utilizing observer data, determined that total bycatch to shrimp ratio for the federal shrimp trawl fleet had decreased further to 2.5:1 for total bycatch to shrimp and 2:1 for finfish to shrimp.[9] Currently, observer data are the only long-term data set documenting bycatch of the fishery and observer coverage is limited (1-2% coverage in the federal fleet and a small number of observers on inshore skimmer vessels). The National Bycatch Report, published by NOAA, considers the observer coverage on the Gulf of Mexico shrimp fleet to be at a pilot/baseline stage and ranks the fishery as a Tier 2 (0=lowest, 4=most successful) for bycatch estimation, indicating that methods for obtaining data and estimating bycatch need improvements before being considered reliable.[10] Characterization of bycatch composition from Scott-Denton et al. (2012) for the federal offshore fleet shows that the majority of species are finfish, but some crustaceans including blue crabs and other shrimp species like seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*) are common.[11] The bycatch species identified are consistent with other shrimp trawl bycatch studies conducted within the Gulf of Mexico (Adkins, 1993 in Louisiana, Burrage 2002 in Mississippi, and Fuls et. al 2002 in Texas). Many incidental catch species are utilized by fishermen and may be retained up to certain limits (varies by state), such as seabobs, rock shrimp, blue crabs, and some finfish species.

National Standard 9 of the MSA requires that "conservation and management measures shall, to the extent practicable: (1) minimize bycatch; and (2) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."[12]
The GMFMC Shrimp FMP contains two objectives that directly address this mandate of the MSA:[13]

- Objective 4: "Promote consistency with the Endangered Species Act and the Marine Mammal Protection Act."
- Objective 5: "Minimize the incidental capture of finfish by shrimpers, when appropriate."

Amendment 13 of the Shrimp FMP (2005), established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition.[14] These methods include the implementation of an electronic logbook program (ELB) for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition. Amendment 13 also required annual completion of a Gulf Shrimp Vessel and Gear Characterization Form, required reporting of landings, and placed a moratorium on the issuance of new permits in the fishery. Due to the high costs of outfitting boats with observers, NOAA Fisheries determined at the time that 1% coverage would be adequate to document information on bycatch composition in the fishery and these data could be combined with detailed effort data from ELBs to extrapolate total bycatch numbers for the fishery. Observer data goes into the Southeast Data, Assessment, and Review (SEDAR) process and is utilized in models to determine bycatch of individual species, which are then used in other assessments.

Endangered Species Bycatch:

One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the ESA, which includes five species of sea turtles, smalltooth sawfish, and Gulf sturgeon.[15] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. NOAA Office of Protected Resources provides detailed information on each species on their website, with each species site containing details on species status, description, habitat, distribution, population trends, threats, regulatory history and conservation efforts.[16]

Sea Turtle Bycatch:

Five species of sea turtles are known to inhabit areas that overlap with shrimp trawling activity in the Gulf of Mexico:

- Hawksbill (*Eretmochelys imbricate*)
  http://www.nmfs.noaa.gov/pr/species/turtles/hawksbill.htm
- Kemp's ridley (*Lepidochelys kempii*)
  http://www.nmfs.noaa.gov/pr/species/turtles/kempsridley.htm
- Leatherback(*Dermochelys coriacea*)
  http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm
- Green (*Chelonia mydas*)
  http://www.nmfs.noaa.gov/pr/species/turtles/green.htm
- Loggerhead (*Caretta caretta*)
  http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.htm

Kemp's ridleys are of most concern among the five species due to their limited range, which is primarily within the Gulf of Mexico. The other four species of sea turtles are found worldwide. Sea turtles do not typically nest along the Louisiana coast and primarily utilize Louisiana waters for foraging.[17]

A National Research Council (NRC) report published in 1990 determined that shrimp trawl bycatch was one of the most significant sources of mortality causing declines in sea turtle populations.[18] Research on TEDs began in the late 1970s, and in 1981 a voluntary program was initiated to encourage fishermen to utilize TEDs in shrimp trawls. Early TED designs were cumbersome and difficult to use and did not gain favor with most fishermen; therefore, TED use was low throughout the 1980s.[19] Federal legislation was passed in 1987 and went into effect in 1989 requiring widespread use of TEDs in shrimp trawls and by 1990 most shrimp trawls were equipped with TEDs. In 1993 a modification was made to allow for increased escape of leatherback turtles and in 2003, and additional modification in regulations to require larger opening further increased escape rates for larger loggerheads and leatherbacks. The 2003 regulation change was expected to reduce mortality of loggerheads by 94% and leatherbacks by 97%. Certified TED designs are required to meet a minimum efficiency threshold of 97% escapement of turtles within a five minute time period. TEDs have been very effective at reducing sea turtle shrimp trawl mortality as summarized by Finkbeiner et al. (2011):[20]

Species	Mortality	
Atlantic/Gulf	Pre-regulation	Post-Regulation
Lepidochelys kempii	4,300	2,700
Caretta caretta	63,500	1,400
Chelonia mydas	500	300
Dermochelys coriacea	2,300	40
Eretmochelys imbricata	20	<10
	70,620	4,450

Post-TED mortality estimates are about 94% lower, (4,450 total deaths) than pre-regulation estimates (70,620). Mandatory TED requirements are currently in place for otter trawls in the shrimp fishery in both state and federal waters.

NOAA and USFWS are jointly responsible for sea turtle conservation under the ESA and are required to consult on all activities that may impact the recovery of each species. Through this consultation process, NOAA has produced several Biological Opinions pertaining to sea turtle conservation and continued authorization of the Gulf of Mexico shrimp fishery. Each Biological Opinion produced by NOAA has authorized the continued operation of the shrimp fishery and includes an Incidental Take Statement. The 2012 Biological Opinion established requirements for enforcement and compliance with TED use in shrimp trawls and set a 'sea turtle capture rate standard' that limits the fishery to a 12 % sea turtle capture rate.[21] The 2014 Biological Opinion maintains this standard (88% effectiveness) in the Incidental Take Statement as a procedure for determining if impacts of the action (continued operation of the shrimp trawl fishery) exceed the expected authorized take.[22] If an Incidental Take Statement is exceeded, a new Biological Opinion is initiated. Compliance rates are actively monitored and a minimum 88% effectiveness rate with TED use must be maintained otherwise NOAA Fisheries is required to take action, which could include closure of the fishery.[23] NOAA Fisheries posts compliance data on their website and current data indicate that the Gulf of Mexico shrimp fleet (including Louisiana) is in compliance with TED requirements.[24]

The 2014 Biological Opinion notes in the Incidental Take section that current data does not allow for reliable estimates of sea turtle take from fishery interactions. The authors note that the last physical observations documenting fishery interactions, which were from "naked nets" (nets without TEDs) in the 1990s, which is not representative of the current fishery. Several assumptions and biases also exist in previous studies to overcome data gaps at the time and these studies are now over 15 years old. Updating survey data to gather the information necessary to make reliable estimates of sea turtle take is considered to be too cost prohibitive; therefore, jeopardy analyses are based on existing knowledge and effort and compliance data from the fishery.[25] The Louisiana Shrimp FMP notes that data needed for accurate assessments of most sea turtle populations are not available and prevents meaningful evaluations that can benefit management.[26] NOAA Fisheries requested input from NRC on methods for improving sea turtle population assessments and in 2010 NRC published a report on sea turtle status and trends. The overarching conclusion was

that several serious demographic data gaps exist precluding accurate assessment and strongly recommends that NOAA and USFWS develop a coherent national strategy for sea turtle assessment to improve data collection methods, data quality, and data availability, which meets standards of external review. Appendix VII of the Louisiana Shrimp FMP provides the detailed conclusions and recommendations of the NRC report.[27]

When federal TED regulations initially passed in 1987, the Louisiana state legislature passed a law preventing LDWF enforcement agents from enforcing TED requirements; however, these requirements have consistently been enforced by NOAA Fisheries and USCG in Louisiana waters since implementation of the regulation. The Louisiana Shrimp FMP, Appendix V provides NOAA and USCG TED compliance reports by state, showing that Louisiana is actively monitored and in compliance with TED regulations.[28] In 2015, the Louisiana law preventing TED enforcement was repealed and LDWF agents are now authorized to enforce all federal TED and BRD requirements. Additionally, in January 2016, the LWFC voted to adopt the federal TED regulations into Louisiana state regulations under Louisiana Administrative Code, Title 76.

Currently, TED compliance is enforced by NOAA Fisheries enforcement agents, USCG, and each of the five state agency enforcement officers. The effectiveness rate required by the Biological Opinion is calculated using NOAA enforcement and inspection rates. Violations are ranked from Level 1 through Level 4 based on severity of violation and likelihood that the offense would lead to a higher turtle capture rate.[29] These compliance data are entered into a matrix to determine the overall effectiveness rate of TEDs in the shrimp trawl fleet. NOAA enforcement and inspection data are currently the main sources of information on TED compliance used to determine effectiveness for the Gulf shrimp fleet. Though TED enforcement and inspections are conducted by the USCG and each state agency, these data are not made public and not necessarily included in NOAA's calculations. Many stakeholders believe that measuring TED compliance using only enforcement data biases the calculation negatively because enforcement is not random, rather, enforcement agents tend to target vessels that are more likely to be out of compliance. This leads to higher reporting of offenses and a lack of documentation of vessels that are in compliance. In 2015, representatives from each of the enforcement agencies met to further discuss inconsistencies in inspection methods and concerns over methods used to determine TED compliance.[30] State and federal agencies continue to discuss possible solutions to these concerns. NOAA enforcement and inspection rates for the shrimp fishery are low due to a limited number of enforcement agents and few members of the NOAA Gear Monitoring Team (GMT) capable of conducting inspections. In 2015, the federal fishery has over 1300 permits and the number of state licenses range from 300-1000+ permits. NOAA inspections cover about 200 vessels per year.[31] Compliance rates are calculated by quarter, and small sample sizes in some months can lead to biases the overall compliance percentages. The inclusion of USCG and state agency enforcement data could improve the sample size and reduce bias in these calculations.

Compliance rates have fluctuated for the past several years and maintaining high TED compliance and effectiveness rates for the fishery requires ongoing efforts. A particular period of concern occurred from March to November 2011, when the TED compliance rate was as low as 66%, with an effectiveness rate ranging between 83-85%.[32] It should be noted that investigation into TED compliance during this time found that the majority of violations were from newly installed TEDs that were not properly installed by net shops. NOAA was able to trace the TEDs back to specific net shops to rectify the problem and the TEDs were corrected prior to the opening of shrimp season; therefore, while compliance rates appear low for this time period, the actual risk to sea turtle populations was avoided.[33] Since 2011, education, outreach, and increased courtesy inspections by NOAA GMT and Sea Grant have helped to increase compliance ratings and NOAA now posts compliance numbers quarterly on their website.[34]

Regulations for TEDs in skimmer trawls and butterfly nets differ from otter trawls. Currently, regulations for skimmer trawls and butterfly nets require either a TED installed in each net, or adherence to maximum tow times (maximum 55 minutes from April 1 to October 31, and 75 minutes from November 1 to March 31).[35] Skimmer trawls and butterfly nets, because of their design, are pulled in with much higher frequency than otter trawls, which greatly reduces the risk of a sea turtle drowning within a net. Tow time regulations are set based on the biological information regarding the length of time sea turtles can remain submerged. Increased turtle strandings in the Gulf of Mexico in 2010-11 prompted observer coverage and further study of turtle bycatch in skimmers. Observer coverage on the skimmer fleet from 2012 through 2014 indicates that over 60% of tows throughout the 3 years of study have exceeded tow time limits, and low compliance with tow time regulations has raised concerns by stakeholders.[36,37,38] These reports prompted NOAA to take action in two ways:- 1) increase tow time awareness and education efforts, and 2) research effective TED designed for mandatory use in skimmers. Data from the 2012 observer coverage indicated that the standard 4" TED design currently in use on otter trawls was not able to exclude smaller sized turtles found in nearshore areas where skimmers are used. NOAA is currently researching TED designs and will likely propose a mandatory TED rule for skimmers in the near future. Currently, adhering to tow time restrictions is the most effective way to prevent turtle mortalities in skimmer nets. The Louisiana Shrimp FMP also notes that may fishermen have argued that they do not encounter sea turtles in certain areas of Louisiana waters and that TED use in these areas causes significant shrimp loss due to high amounts of woody debris from river discharge that blocks TEDs.[39] Sea turtle distribution data are lacking, and LDWF is currently working to develop sea turtle monitoring in state waters to better understand sea turtle activity and potential interactions with the Louisiana inshore shrimp fleet. LDWF recently received grant funds from the NFWF 2015 Gulf Coast Conservation Grants program to begin monitoring sea turtle populations in Louisiana waters starting in Spring 2016.[40]

In addition to efforts to reduce sea turtle mortality from fishery interactions, NOAA Fisheries, USFWS, GSMFC, state agencies and shrimp industry groups have contributed to efforts to protect sea turtle nesting beaches in Mexico and areas

throughout the Gulf coast to assist in the recovery of sea turtle populations.[41] Protection of nesting grounds has been a significant conservation action by eliminating direct harvest of turtle eggs and reducing nest predation. NOAA SEFSC Galveston Lab participates in a Captive Rearing Program.[42]

Smalltooth sawfish (*Pristis pectinata*)
http://www.nmfs.noaa.gov/pr/species/fish/smalltoothsawfish.htm

The Recovery Plan for Smalltooth Sawfish cites bycatch in fisheries (including the shrimp fishery) as a primary reason for the decline of this species.[43] Previous documentation of landings as incidental catch in the shrimp fishery were reported between 1940s-1980s in Louisiana and Texas; however, there has been minimum documentation of recent landings and informal interviews by port agents indicate that recent interactions are rare. The population of smalltooh sawfish is thought to have declined by as much as 95% and the geographical range of the species is likely significantly diminished. Currently, three NWRs in Florida provide habitat protection for known reproducing populations of smalltooth sawfish. Catch or harm of smalltooth sawfish is illegal, and guidelines have been published on the handling and release of smalltooth sawfish that are incidentally caught in commercial and recreational fisheries. The Recovery Plan estimates for one smalltooth sawfish taken in the shrimp trawl fishery per year. It is possible that the implementation of TEDs and BRDs in the shrimp fishery would allow for smalltooth sawfish escape should interactions with shrimp trawls occur. However, there is still some question; as to whether trawl bycatch might impact recovery if/when this species population begins to rebuild and potential interactions increase.

Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)
http://www.nmfs.noaa.gov/pr/species/fish/gulfsturgeon.htm

The most recent 5-year review (2009) for the Recovery Plan for Gulf Sturgeon notes that bycatch in shrimp trawls has been infrequently documented in past and that implementation of TED and BRD regulations has likely mitigated bycatch impacts to this species.[44] No regulatory actions are required directly in relation to bycatch of Gulf sturgeon for the shrimp fishery.

Marine Mammal Bycatch:
The MMPA 1994 revision includes changes of regulation regarding the incidental take of marine mammals in commercial fishing operations, requiring a goal to reduce serious injury and mortality of marine mammals to "insignificant levels", approaching a zero mortality rate. "Insignificant Level" is defined as less than 10% of the potential biological removal (PBR).[45] NOAA's Office of Protected Species evaluates fisheries based on their potential interaction with marine mammals during fishing operations and places fisheries into three categories: Cat. I- high interaction, Cat. II- med-low interaction, and Cat. III- little or no known interactions.[46] The Gulf of Mexico shrimp fishery is currently listed as a Category II fishery on the List of Fisheries.[47] This determination was based on potential interactions with bottlenose dolphins. Lack of a calculated PBR for the Gulf of Mexico bottlenose dolphin populations, data from stranding programs, and low observer coverage in the fishery are all reasons that prompted NOAA to assign a Cat. II ranking. Cat. II designation requires that each

fishery participant be registered with the Office of Protected species and carry an authorization certificate. Typically, registration with the Marine Mammal Authorization Program is combined with state and federal permitting systems and all fishermen receiving permits are registered with the Office of Protected Species automatically. Cat. II requirements also require the fishery to have an observer program and fishermen must carry an observer onboard if requested, and must comply with any take reduction plans in place. There is currently no take reduction plan in the Gulf of Mexico for bottlenose dolphins. Fishermen are also required to report all incidental injuries and mortalities of marine mammals to the Office of Protected Species.

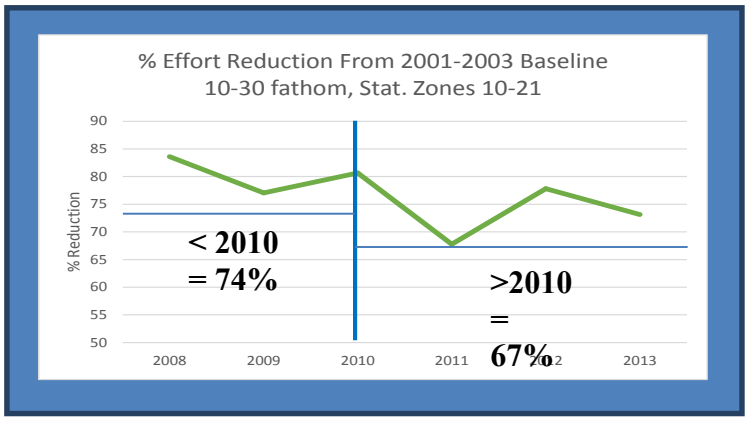
Commercially and/or Recreationally Important Finfish Species Bycatch:

Red snapper *(Lutjanus campechanus)*

Red Snapper bycatch has been another major concern in the Gulf of Mexico shrimp fishery. The Red Snapper fishery in the Gulf of Mexico is considered overfished and is in a rebuilding plan.[48] This rebuilding plan included a significant reduction in juvenile red snapper bycatch in the Gulf of Mexico shrimp fishery. Amendment 9 of the Shrimp FMP deals directly with the reduction of red snapper bycatch.[49] The goal of Amendment 9 was to reduce bycatch of juvenile red snapper in age 0 and age 1 groups by 50%, which was the amount determined by NOAA Fisheries as necessary for the rebuilding plan. Amendment 9 required the use of BRDs in shrimp trawls west of Cape San Blas, FL in the U.S. EEZ. East of Cape San Blas was exempt at the time due to low abundance of red snapper in this area. State waters were not considered a factor because it was determined that juvenile red snapper typically occur beyond depths of 5 fathoms, and mainly occurred beyond 10 fathoms (80-83% occurrence below 10 fathoms).[50] BRD requirements included 1) reduction of finfish/shrimp ratio by 50%, 2) does not reduce shrimp catch by more than 3%, and 3) does not increase gear cost by more than 10%. BRD devices are certified by NOAA Fisheries and BRDs are required in all shrimp trawls except royal red trawls and try nets (nets smaller than 12 ft.). The implementation of BRD regulations in 1998, and the requirement of TEDs, which also allow for the release of some finfish bycatch, along with the closure seasons/areas in place, and reduction in shrimp effort since the 1990s have all contributed to significant reductions in juvenile red snapper bycatch. The BRD certification criteria were changed by an August 2006 Regulatory Amendment to require that total finfish reduction be reduced by 30% with no specific red snapper requirement.[51] In 2007, Amendment 14 (effective in 2008) established a specific bycatch reduction target for the shrimp fishery and designated seasonal closure restrictions that could be used to manage shrimp fishing effort in relation to the target bycatch reduction goal.[52] The seasonal closure areas were designated within the statistical zones 10-21 between 10-30 fathoms and designed to start in conjunction with the annual Texas Closure, if needed. The need for the closure, and its duration and extent is determined annually by an SEFSC assessment of the previous year's shrimp effort within the designated zone, and associated red snapper mortality. If it is determined that a seasonal closure is necessary, then the Regional Administrator will set the closed season area and duration as necessary to meet the bycatch reduction target.

Bycatch reduction target for juvenile red snapper in the shrimp fishery have been

meet and exceeded through use of BRDs and significant reductions in shrimp effort (see graph below).[53]



Some stakeholders have also raised concern over other commercially and recreationally important species, such as blacknose shark (*Carcharhinus acronotus*). In 2007, NOAA Fisheries determined that blacknose shark was overfished and experiencing overfishing; bycatch and associated mortality from the shrimp trawl fishery was considered a factor in the decline of the species.[54] Since this time, the blacknose shark population has been divided into two separate populations: an Atlantic population and a Gulf of Mexico population.[55] The Atlantic population remains listed as overfished and overfishing; however, the Gulf of Mexico stock is currently considered unknown based on the 2011 NOAA Fisheries stock assessment.[56] Raborn et al. (2012) determine that implementation of TEDs was effective in mitigating bycatch of blacknose sharks in the Gulf of Mexico shrimp fishery since sharks are also capable of escaping trawls through TEDs.[57]

Other Common Bycatch Species Bycatch:

Amendment 9, requiring BRDs in shrimp trawls west of Cape San Blas, FL was implemented primarily with the intent of reducing juvenile red snapper; however, it also accomplished bycatch reduction of other common finfish species caught in trawls. Amendment 10 followed, requiring BRDs in shrimp trawls east of Cape San Blas to reduce finfish bycatch by 30% as required by the MSA bycatch reduction requirements.[58] There are no other strategies in place designed to specifically reduce other finfish in the Gulf of Mexico, and targets for reduction are based on finfish as a group. No other finfish in the Gulf of Mexico have been identified as being "at risk" due to bycatch in the shrimp fishery. Many of the typical species caught in shrimp trawls are highly productive, short-lived species with high resilience to fishing pressure.

Common species caught in shrimp trawls include:

- Atlantic croaker (*Micropogonias undulates)*
- Seatrouts (*Cynoscion sp.*)
- Longspine porgy (*Stenotomus caprinus*,)
- Inshore Lizardfish (*Synodus foetens*)

Based on a recent analysis by Raborn et al. (2014) these are the only finfish species

and genus that represent 5% or higher in bycatch of shrimp trawls. Analysis of these species indicates that shrimp trawl bycatch does not pose a threat to any of these species.[59]

The 'Ecosystem Considerations' section of the Louisiana Shrimp FMP discusses bycatch and discards of the fishery.[60] In addition to the research and results listed above for otter trawls, this section also discusses bycatch in skimmer trawls, used predominantly in state waters. Limited information is available on bycatch in butterfly nets; however, this sector of the fishery is small (only about 3%) and bycatch appears to be fairly consistent with other shrimp trawl methods.

Louisiana does not require the use of BRDs in state waters, as is required in federal waters; therefore, bycatch ratio estimates for otter trawls, provided above, may differ somewhat from otter trawls used in state waters. There is currently no observer coverage on otter trawls within state waters and data on bycatch is limited to previous studies. Adkins (1993) conducted bycatch studies on shrimp vessels in Louisiana waters, sampling offshore, inshore, and "wingnet" (butterfly nets) to characterize and compare bycatch ratios of the different areas and gear types.[61] The Adkins study provides bycatch information prior to the widespread use of BRDs. Adkins (1993) found the overall average bycatch ratio to be 3.21:1 and notes that inshore vessels typically had higher bycatch estimates (3.0:1) than offshore vessels (2.2:1), but that bycatch ratios vary significantly by area, time of day, gear type and size of net. Species composition of bycatch, in order of quantity, was bay anchovy (12%), Gulf menhaden (5%), sand seatrout (4%), Atlantic croaker (3.5%), sea catfish (2.3%), blue crab (2.5%), seabobs (1%), and spot (1%). This composition is generally consistent with early studies cited in the Adkins report, and more recent studies such as Scott-Denton et al. (2012). Adkins also notes that no popular commercial or recreational finfish species were present in significant amounts in bycatch, and the common bycatch species found in this study showed no indication of serious impacts from bycatch removals. Since the development of BRDs in the 1990s and federal regulations requiring BRDs in offshore fisheries, many fishermen have also adopted use of these devices within state waters to decrease culling time and increase quality of target catch. Many shrimp fishermen in Louisiana waters now often use BRDs voluntarily, which has potentially reduced the overall bycatch ratio in state waters since the Adkins report; however, no recent studies are available to confirm this. Additionally, shrimpers in Louisiana are allowed to retain and sell most bycatch if they are in compliance with regulations for each species.[62] Retained incidental catch is documented through Trip Ticket Program if sold for commercial purposes. Many fishermen also retain bycatch for personal consumption but this practice has not been quantified. LDWF recently conducted a brief summary comparing the Adkins (1993) bycatch survey to LDWF fishery-independent trawl data (unpublished data). LDWF fishery independent sampling is conducted using similar trawl gear and could be used as an indicator of common bycatch species in the shrimp trawl fishery. Comparison of recent survey data (2013, 2014, 2015) to the bycatch species composition results in Adkins (1993) show high correspondence between the two data sets. Results indicate very similar species composition of the top ten bycatch species (by frequency of occurrence) with bay anchovy, Atlantic croaker, spot, sand

seatrout, Gulf menhaden and blue crab as the top eight ranked species. This summary also notes that the relative abundance of the top twenty species of the fishery-independent survey has remained relatively consistent over time.

Several studies have indicated that bycatch in skimmer trawls is substantially lower than bycatch in traditional otter trawls. Hein and Meier (1995) discuss the development of the skimmer trawl in Louisiana, which began around 1983 in the Barataria area primarily for use during white shrimp season.[63] Hein and Meier (1995) found that the advantages of skimmer trawls, including increased shrimp catch (for white shrimp), less debris and bycatch, lower fuel consumption and easier maneuverability in shallow water all lead to the popularization of skimmer use in Louisiana waters. Since the cod end can be retrieved while the net remains in the water fishing, nets are checked and emptied more frequently leading to less bycatch and higher survivability of discards as well as increased quality of retained catch. Early studies of bycatch in skimmer trawls in North Carolina by Coale et al. (1994) comparing skimmer trawls to otter trawls found that skimmers typically caught less bycatch than otter trawls during white shrimp season and bycatch in skimmers had significantly higher survivability rates.[64] The authors found that this was not the case for brown and pink shrimp season. More recently, Scott-Denton et al. (2007) conducted skimmer bycatch study using a voluntary observer program on inshore vessels in Louisiana in 2004-2005.[65] Findings indicated that the discards to landings ratio was .63 and main bycatch species consisted of Gulf menhaden (8%), blue crab (7%) and Atlantic croaker (2%). In 2012, a mandatory observer program was implemented for the northern Gulf skimmer fleet in Louisiana, Alabama, and Mississippi. Annual observer reports are published with data on bycatch rates, sea turtle interactions, BRD and TED use, and adherence to tow time restrictions. Bycatch ratios from these reports are: 2012 ratio was 1.24, 2013 ratio was .92, and 2014 1.94.[66] These reports also document voluntary use of TEDs and BRDs in skimmers and indicate that over 40% of shrimpers are voluntarily using BRDs, and 3-5% are voluntarily using TEDs.

BOTTOM HABITAT IMPACTS:

Shrimp trawling can also cause damage to the sea floor by burying, exposing, or injuring marine organisms and submerged vegetation and may also impact the ecosystem by resuspension of sediments and release of nutrients into the water column. The shrimp trawl fishery in the northern Gulf of Mexico primarily trawls with smaller nets and is active in primarily mud, sand or peat bottoms in areas that are storm-prone and typically experience habitat disturbances from natural causes as well as other anthropogenic activities. Chang et al. (2001) examined resuspension of sediments during hurricane events and determined that impacts occur to depths beyond 70 meters.[67] Typical shrimp trawling activities occur in shallower depths, generally above 30 meters. Dellapenna et al. (2006) determined that the turbidity plume following a shrimp trawl was comparable to the turbidity produced by a 9 to 10 m/s wind event at the study area in Galveston Bay, Texas.[68] The degree to which bottom trawls disturb sediment depends on the sediment type and the gear type, weight and speed. There are wide-ranging results from previous trawl impact studies possibly due to differences in trawl methods, gear and/or habitat type; however, since

trawl gear is designed to maintain contact with the seabed, some level of resuspension and sediment penetration is inevitable. An understanding of ecological effects is dependent on the site-specific characteristics such as bottom type, depth, community type, gear and methods used and the intensity of activity and other natural disturbances. Recovery of trawled substrate is also dependent on sediment type, depth, and natural influences. Few studies have focused on habitat recovery after trawl impacts and most existing studies have not addressed cumulative impacts of repeated trawling occurrences that would be typical of commercial fishing over time.[69] NRC (2002) reported that, based on rough estimates of the number of times a given area was swept, the Gulf of Mexico was one of the areas of highest intensity of effort.[70] NRC (2002) also notes that a significant reduction in effort has occurred in many areas due to area closures, seasonal closures and gear restrictions. A study by Jennings and Kaiser (1998) found it plausible that light shrimp trawls likely do not cause significant disturbance to shallow water communities in poorly sorted sediments. Additionally, they note that organisms in soft mud are capable of burrowing up to two meters deep and are likely not impacted by passing trawls.[71] Dellapenna et al. (2006) conducted studies on the impact of shrimp trawling in Galveston Bay, Texas and found that the maximum depth excavated by trawl gear was 1.5 cm.[72] Sanchez et al. (2000) similarly found that sporadic episodes of trawling in muddy habitats "may cause relatively few changes in community composition" and that "natural variability at some sites may exceed the effects of disturbance from fishing" and Ball et al. (2000) notes that epifauna are generally scarce in muddy sediment habitats.[73] Barnette (2001) additionally reports on impacts of skimmer trawls vs. otter trawl, finding that skimmer trawls likely have less impact than otter trawls due to the absence of trawl doors interacting with the floor bottom. Skimmer trawls; however, are typically active in shallower waters (10 feet) and may interact more with sensitive habitats such as submerged aquatic vegetation (SAV). Impacts on EFH have been assessed by NOAA and the GMFMC in the Generic Amendment for addressing EFH requirements in FMPs. The EFH amendment applies to all seven GMFMC FMPs.[74] The Initial EFH amendment was developed in 1998 and included an EIS. Section 5.1 identifies EFH for the shrimp species managed in the Gulf of Mexico Shrimp FMP (brown, white, pink, and royal red). Section 6.1 identifies fishing-related threats, 6.2 identifies non-fishing related threats. Section 7 provides management options to minimize impacts and Section 8 identifies research needs. The EFH amendment is reviewed and updated every five years.

The 2005 EFH Amendment 3 recommends the following management measures related to the shrimp fishery to minimize impacts:[75]

- prohibit use of trawl gear, bottom longlines, buoy gear and traps on coral reefs in the EEZ (includes East and West Flower Garden Banks, McGrail Bank, Pulley Ridge, North and South Tortugas Ecological Reserve, and coral communities in Stetson Bank)
- require a weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf of Mexico EEZ.

These recommendations were adopted into regulation by NOAA Fisheries.[76] The EFH review in 2010 found that effort in all commercial fisheries had declines between 2000 and 2008, and that no new recommendations were necessary beyond the 2005 recommendations.

	Louisiana does not require a weak link on tickler chains in state waters; however, the bottom area is well known and obstructions and reef areas are avoided, and prohibited areas have been established to prevent damage to sensitive habitats.	

[1] Kelleher, Kieran. *Discards in the world's marine fisheries: an update*. No. 470. Food & Agriculture Org., 2005. http://www.fao.org/docrep/008/y5936e/y5936e00.htm

[2] National Marine Fisheries Service. 2011. *U.S. National Bycatch Report* [W. A. Karp, L. L. Desfosse, S. G. Brooke, Editors]. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-117C. http://www.nmfs.noaa.gov/by_catch/BREP2011/2011_National_Bycatch_Report.pdf

[3] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[4] Portley, N., M. Westmeyer, and J.M. Garcia Caudillo. 2015. *SFP Report on the Wild Shrimp Sector: Bycatch in Global Shrimp Fisheries*. Sustainable Fisheries Partnership Foundation. http://cmsdevelopment.sustainablefish.org.s3.amazonaws.com/2015/08/26/issue%20report_shrimp%20bycatch_final-2-78ef199d.pdf

[5] National Marine Fisheries Service. 2011. *U.S. National Bycatch Report* [W. A. Karp, L. L. Desfosse, S. G. Brooke, Editors]. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-117C. http://www.nmfs.noaa.gov/by_catch/BREP2011/2011_National_Bycatch_Report.pdf

[6] National Marine Fisheries Service. 2013. U.S. National Bycatch Report First Edition Update 1 [L. R. Benaka, C. Rilling, E. E. Seney, and H. Winarsoo, Editors]. U.S. Dep. Commerce. https://www.st.nmfs.noaa.gov/Assets/Observer-Program/bycatch-report/NBR_FirstEditionUpdate1.pdf

[7] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[8] Frank Helies and Judy Jamison (2009) "Reduction Rate, Species Composition, and Effort: Assessing Bycatch Within the Gulf of Mexico Shrimp Trawl Fishery." NOAA/NMFS Cooperative Agreement Number NA07NMF4330125 (#101) http://www.gulfsouthfoundation.org/uploads/reports/101_final4.pdf

[9] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[10] National Marine Fisheries Service, 2011.

[11] Scott-Denton, et al., 2012.

[12] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[13] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[14] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[15] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[16] "Protected Resources" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[17] Bourgeois et al., 2015. p.42.

[18] National Research Council (US). Committee on Sea Turtle Conservation. *Decline of the sea turtles: causes and prevention*. National Academies Press, 1990.

[19] "History of Turtle Excluder Devices (TEDs)" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/history.htm

[20] Elena M. Finkbeiner, Bryan P. Wallace, Jeffrey E. Moore, Rebecca L. Lewison, Larry B. Crowder, and Andrew J. Read, "Cumulative estimates of sea turtle bycatch and mortality in USA fisheries between 1990 and 2007" Biological Conservation 144 (2011) 2719–2727 http://micheli.stanford.edu/pdf/Cumulative%20estimates%20of%20sea%20turtle%20bycatch%20and%20mortality%20in%20U.S.A.%20fisheries%20between%201990-2007.pdf

[21] NMFS. 2012. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/fisheries_bo/southeastshrimpbiop_final.pdf

[22] NMFS. 2014.

[23] NOAA Fisheries. *Turtle Excluder Device (TED) Compliance Policy*. Draft May 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/ted_compliance_policy.pdf

[24] "TED compliance" *NOAA Fisheries*. Web. Accessed June 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/index.html

[25] NMFS. 2014, p. 231.

[26] Bourgeois et al., 2015. p.48.

[27] Bourgeois et al., 2015. p.108-113.

[28] Bourgeois et al., 2015. p.104-105.

[29] NOAA Fisheries. "Penalty Matrix for Endangered Species Act" *NOAA Policy for Assessment of Penalties and Permit Sanctions*. March 2011. http://www.shrimpalliance.com/new//wp-content/uploads/2012/03/2pagesfromPenaltyPolicy.pdf

[30] Gulf and South Atlantic Fisheries Foundation. “Gulf and South Atlantic News, Volume 16, Issue 1” May 2014 http://gulfsouth.ehclients.com/uploads/newsletters/5_15newsletter_short.pdf

[31] NOAA Fisheries, 2015.

[32] NMFS. 2014.

[33] Bourgeois et al., 2015. p.44.

[34] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[35] 50 CFR § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[36] Pulver, J. R., E. Scott-Denton, and J. A. Williams. "Characterization of the US Gulf of Mexico skimmer trawl fishery based on observer coverage." *NOAA Technical Memorandum NMFS-SEFSC* 636 (2012): 27. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2012_skimmer_trawl_observer_report.pdf

[37] Pulver, Jeffrey R., Elizabeth Scott-Denton, and Jo A. Williams. "Observer coverage of the 2013 Gulf of Mexico skimmer trawl fishery." *NOAA Technical Memorandum NMFS-SEFSC* 654 (2014): 25.http://www.sefsc.noaa.gov/turtles/TM_NMFS_SEFSC_654_Pulver_etal_skimmer.pdf

[38] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver “Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery” NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[39] Bourgeois et al., 2015. p.66.

[40] “2015 Gulf Coast Conservation Grants Program” *National Fish and Wildlife Foundation.* Web. Accessed November 2015. http://www.nfwf.org/gulfconservation/Pages/2015-project-list.aspx

[41] Bourgeois et al., 2015. p.47.

[42] ”Sea turtles” *NOAA Galveston Laboratory.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/seaturtles/index.html

[43] National Marine Fishery Service (NMFS). 2010. *Smalltooth Sawfish 5-Year Review: Summary and Evaluation.* http://www.nmfs.noaa.gov/pr/pdfs/species/smalltoothsawfish_5yearreview.pdf

[44] USFWS and NMFS. 2009. *Gulf Sturgeon (Acipenser oxyrinchus desotoi) 5-Year Review*. http://www.nmfs.noaa.gov/pr/pdfs/species/gulfsturgeon_5yearreview.pdf

[45] “Marine Mammal Protection Act” *NOAA Fisheries*. Web. Accessed August 2015. http://www.nmfs.noaa.gov/pr/laws/mmpa/

[46] “List of Fisheries” *NOAA Fisheries Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/interactions/lof/#report

[47] NOAA Office of Protected Species. “U.S. Atlantic, Gulf of Mexico Shrimp Trawl Fishery” http://www.nmfs.noaa.gov/pr/pdfs/fisheries/lof2012/southeastern_us_atlantic_gulf_shrimp_trawl.pdf

[48] "Red Snapper" *Fishwatch*. Web. Accessed June 2015. http://www.fishwatch.gov/seafood_profiles/species/snapper/species_pages/red_snapper.htm

[49] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[50] Nichols, Scott. *The spatial and temporal distribution of the bycatch of red snapper by the shrimp fishery in the offshore waters of the US Gulf of Mexico*. Pascagoula, Mississippi: National Marine Fisheries Service, Mississippi Laboratories, 1990.

[51] GMFMC. *A Framework Measures to Address the Bycatch Reduction Criterion for Shrimp Trawls in the Gulf of Mexico West of Cape San Blas, Florida Under the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico*. 2006 http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/shrimp/archives/shrimp_reg_amend_aug_2006.pdf

[52] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[53] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[54] SEDAR 13. "Stock Assessment Report- Small Coastal Shark Complex, Atlantic Sharpnose, Blacknose, Bonnethead, and Finetooth Shark" Southeast Data, Assessment, and Review. 2007. http://www.nmfs.noaa.gov/sfa/hms/species/sharks/documents/shark_stock_assessment_report_11-14-07.pdf

[55] SEDAR 21. "HMS Gulf of Mexico Blacknose Shark Stock Assessment Summary report" Southeast Data, Assessment, and Review. 2011. http://www.nmfs.noaa.gov/sfa/hms/species/sharks/documents/gulf_of_mexico_blacknose_shark_assessment_summary_final.pdf

[56] NOAA Fisheries. *Status of Stocks 2014, Annual Report to Congress on the status of U.S. Fisheries.* http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2014/2014_status_of_stocks_final_web.pdf

[57] Scott Raborn, Benny Gallaway, John Cole, William Gazey and Kate Andrews "Effects of Turtle Excluder Devices (TEDs) on the Bycatch of Three Small Coastal Sharks in the Gulf of Mexico Penaeid Shrimp Fishery" 2012. North American Journal of Fisheries Management 32:333-345 http://www.tandfonline.com/doi/abs/10.1080/02755947.2012.678962#preview

[58] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[59] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[60] Bourgeois et al., 2015. p.40.

[61] Gerald Adkins. *A Comprehensive Assessment of Bycatch in the Louisiana Shrimp Fishery.* Technical Bulletin No. 42. Louisiana Department of Wildlife and Fisheries. 1993

[62] Bourgeois et al., 2015. p.40.

[63] Stephen Hein and Paul Meier. "Skimmers: Their Development and Use in Coastal Louisiana." *Marine Fisheries Review 57(1),* 1995 http://spo.nmfs.noaa.gov/mfr571/mfr5712.pdf

[64] J. Stuart Coale, Roger Rulifson, James Murray, and Robert Hines. "Comparisons of Shrimp Catch and Bycatch between a Skimmer Trawl and an Otter Trawl in the North Carolina Inshore Shrimp Fishery." *North American Journal of Fisheries Management* 14:751-768. 1994 https://www.researchgate.net/profile/Roger_Rulifson/publication/254310611_Comparisons_of_Shrimp_Catch_and_Bycatch_between_a_Skimmer_Trawl_and_an_Otter_Trawl_in_the_North_Carolina_Inshore_Shrimp_Fishery/links/5422d5610cf26120b7a60347.pdf

[65] Coale et al., 1994

[66] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[67] G. C. Chang, T. D. Dickey, and A. J. Williams III. "Sediment Resuspension over a continental shelf during Hurricanes Edward and Hortense." *Journal of Geophysical Research, Vol. 106, No. C5*. May 2001 http://onlinelibrary.wiley.com/doi/10.1029/2000JC900032/pdf

[68] Dellapenna et al., 2006 as cited in GMFMC. *5-Year Review of the Final Generic Amendment Number 3 Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the Fishery Management Plans of the Gulf of Mexico*. October 2010. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/EFH%205-Year%20Review%20Final%2010-10.pdf

[69] Michael C. Barnette. *A review of the fishing gear utilized within the Southeast Region and their potential impacts on essential fish habitat*. NOAA Technical Memorandum NMFS-SEFSC-449. February 2001 http://www.safmc.net/managed-areas/pdf/Barnettegear.pdf

[70] National Research Council, 2002.

[71] Simon Jennings and Michel Kaiser. "The Effects of Fishing on Marine Ecosystems" *Advances in Marine Biology*. January 1998. http://www.researchgate.net/profile/Michel_Kaiser/publication/222490649_The_Effects_of_Fishing_on_Marine_Ecosystems/links/0fcfd50af7a1a0577a000000.pdf

[72] Dellapenna et al., 2006

[73] Sanchez et al., 2001 and Ball et al., 2001 as cited in Barnette, 2001 http://www.safmc.net/managed-areas/pdf/Barnettegear.pdf)

[74] "Essential Fish Habitat Amendments" *Gulf of Mexico Fishery Management Council*. Web. Accessed November. 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

[75] GMFMC. *Generic Amendment Number 3 for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 2005. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINAL3_EFH_Amendment.pdf

[76] 50 CFR § 622.15 (coral protection) and § 622.9 (prohibited gear) http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

7.2.2 (e) - Have depleted stocks been allowed to recover or, where appropriate, restored?
Yes...[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
The FAO defines 'depleted' as "a stock, driven by fishing, at very low level of abundance compared to historic levels, with dramatically reduced spawning biomass and reproductive capacity."[1] Based on the recent assessments of brown shrimp and white shrimp, neither population has experienced overfishing or an overfished status since NOAA Fisheries began monitoring the stocks and, therefore, has never been considered a depleted stock.[2,3] Amendment 13 of the GMFMC Shrimp FMP states "since shrimp are an annual crop, in that abundance in a given year is dependent on environmental factors rather than fishing effort, fluctuations in effort either up or down have not resulted in significant reductions in spawning stock biomass that could subsequently have caused recruitment overfishing."[4] In Amendment 13 (2005), the GMFMC established an overfishing level for each of the penaeid species in terms of a parent stock level, and defined an overfished condition as one half of the overfishing parent stock levels. Recently, NOAA Fisheries changed from a VPA model to a Stock Synthesis Model to improve the quality of stock assessments. The GMFMC SSC determined that the Stock Synthesis model was the best available science for determining the status of the Gulf shrimp stocks. New SDC were developed to align with model outputs. In 2015, Amendment 15 of the Shrimp FMP redefined the MSY, overfishing and overfished definitions for the shrimp fishery to the following:[5] MSY: - Brown shrimp: 146,923,100 pounds of tails - White shrimp: 89,436,907 pounds of tails Overfishing: - Brown shrimp: F_{MSY} 9.12 - White shrimp: F_{MSY} 3.48 Overfished: - Brown shrimp: SSB_{MSY} is 6,098,824 pounds of tails - White shrimp: SSB_{MSY} is 365,715,146 pounds of tails NOAA Fisheries has monitored stock levels for both shrimp species since 1970. Stock levels for both species have remained above the established thresholds throughout the monitoring period and neither stock is not considered overfished or undergoing overfishing. Louisiana continues to monitor shrimp stocks closely in state waters, and works directly with the GMFMC and NOAA Fisheries to provide data for stock assessments and ensure that shrimp stocks in the Gulf of Mexico remain above the determined reference points.		

[1] "FAO Term Portal: Fisheries" *Food and Agricultural Organization of the United Nations*. Web. Accessed November 2015. http://www.fao.org/fi/glossary/

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[2] Hart, R.A. 2014. Stock Assessment Update for White Shrimp, *Litopenaeus setiferus*, in the U.S. Gulf of Mexico for 2014. SEFSC Galveston. 18pp. http://www.galvestonlab.sefsc.noaa.gov/publications/pdf/958.pdf

[3] Hart, R.A. 2014. Stock Assessment Update for Brown Shrimp, *Farfantepenaeus aztecus*, in the U.S. Gulf of Mexico for 2014. SEFSC Galveston. http://www.galvestonlab.sefsc.noaa.gov/publications/pdf/956.pdf

[4] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[5] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

7.2.2 (f) - Have adverse environmental impacts on the stocks from human activities been assessed and, where appropriate, rectified? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
.	Due to increases in coastal populations, high shipping traffic, the high activity of oil and gas industry in the Gulf region and other human activities, anthropogenic environmental impacts are a constant concern and require regular assessment and rectification when necessary. There is a network of agencies and programs responsible for addressing the various human impacts on marine and coastal environments and natural resources in Louisiana and across the Gulf region, as listed below. While efforts by these agencies are ongoing and substantial restoration has taken place, many impacts are still being assessed and have not been fully rectified. Continuing efforts are needed to understand the impacts of disaster events, such as the 2010 Deepwater Horizon Oil Spill, as well as the ongoing concerns of wetlands loss and pollution. The Louisiana Shrimp FMP identifies three main issues in the Current Issues and Management Options section that relate to human impacts: Habitat Loss, Hypoxia, and Coastal Restoration, Flood Control, and Freshwater Division Projects.[1] - Habitat Loss: The management community of Louisiana recognize the rapid changes of Louisiana's coastline due to both manmade and natural events, and that these changes have the potential to impact the ability of coastal wetlands to provide suitable habitat for marine species. - Hypoxia: Large areas of oxygen-depleted or hypoxic waters occur from late spring to early fall off Louisiana's coast, which is largely attributed to heavy nutrient loads discharged by the Mississippi River. - Coastal Restoration, Flood Control, and Freshwater Diversion Projects: Projects designed for flood control and freshwater diversions have the potential to impact population abundance and habitat of marine species. The Louisiana Shrimp FMP provides options for management to consider on each of these issues, which primarily require collaboration between all of the state and federal agencies below.	

State agencies:
The Louisiana Department of Environmental Quality (LDEQ) is the primary agency responsible for setting pollution standards and monitoring water quality of the state.[2] The LDEQ mission is "to provide service to the people of Louisiana through comprehensive environmental protection in order to promote and protect health, safety and welfare while considering sound policies regarding employment and economic development." LDEQ is divided into numerous divisions and programs that deal with air, water, and waste monitoring and permitting as well as education and outreach programs to promote responsible stewardship of environmental resources.

The Louisiana Department of Natural Resources (LDNR) is charged with regulating development and managing resources in Louisiana's coastal zone.[3] The LDNR contains the Office of Conservation, Office of Mineral Use, and Office of Coastal Management, all of which play a role in managing oil, gas, and lignite resources of the state. The Office of Coastal Management is responsible for the regulation of uses in the Louisiana coastal zone, especially those which have a direct and significant impact on coastal waters.

The Louisiana Oil Spill Coordinator's Office (LOSCO), established by the legislature in 1991, is responsible for coordinating the state's oil spill response efforts, making sure that cleanups are properly completed and is the single point of contain for all programs related to oil spills in Louisiana.[4] LOSCO responds to all reports of oil or hazardous substance release and coordinates regional and national response efforts.

Louisiana's Coastal Protection and Restoration Authority (CPRA) is mandated to "develop, implement, and enforce a comprehensive coastal protection and restoration Master Plan."[5] CPRA works with other state agencies and federal, state, and local political subdivisions to work toward a "safe and sustainable coast" that will protect "communities, the nation's critical energy infrastructure, and our bountiful natural resources for generations to come." CPRA's main work is around the Coastal Master Plan, a multi-billion dollar plan that aims to conserve, protect, and rebuild the Louisiana coast.

Federal Agencies:
USCG Marine Environmental Protection Program addresses concerns of invasive species, oil and chemical spills, and ocean dumping.[6]

Environmental Protection Agency (EPA) Emergency Management Program ensures that facilities and organizations take steps to prevent oil spills, chemical accidents, and other emergencies; implement planning and preparedness requirements; and respond to environmental emergencies.[7]

EPA Mississippi River/Gulf of Mexico Hypoxia Task Force was established in 1997 to understand the causes and effects of eutrophication in the Gulf of Mexico. The Task Force coordinates activities to reduce the size, severity, and duration; and ameliorate the effects of hypoxia. Activities include coordinating and supporting

	nutrient management activities from all sources, restoring habitats to trap and assimilate nutrients, and supporting other hypoxia related activities in the Mississippi River and Gulf of Mexico watersheds.[8] NOAA- Office of Response and Restoration provides comprehensive solutions to environmental hazards caused by oil, chemicals, and marine debris, and serves as the scientific support coordinator for the USCG during responses to spills.[9] USFWS- Environmental Contaminants Program emphasizes contingency planning and cooperation at the local, regional and national level in an effort to minimize the injury to fish, wildlife, and sensitive environments from oil spills.[10] <u>Deepwater Horizon oil spill restoration efforts:</u>[11] Numerous state and federal agencies are involved in the restoration efforts for the Deepwater Horizon oil spill that occurred in the Gulf of Mexico in 2010. The primary programs include: - The Natural Resource Damage Assessment (NRDA) is a legal process that works to restore natural resources to pre-spill conditions after they have been impacted by oil and chemical spills and to compensate the public for impacted resources and services.[11] NRDA is designed to carry out the objectives set forth in the Clean Water Act, the Oil Pollution Act, and the Comprehensive Environmental Response Compensation and Liability Act.. - RESTORE Act: The recovery and restoration in response to the 2010 Deepwater Horizon oil spill is still ongoing. In July of 2012 the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (RESTORE Act) was signed into law to direct the majority (80%) of the civil penalties paid under the Federal Water Pollution Control Act as a result of the spill. RESTORE funds are dedicated to restoration efforts in each of the affected Gulf States.[12] - NFWF Gulf Environmental Benefit Fund, created from two settlement plea agreements resolving criminal cases against British Petroleum (BP) and Transocean for the Deepwater Horizon oil spill, dedicated funds in each state for natural resource restoration projects.[13]	

[1] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[2] *Louisiana Department of Environmental Quality.* Web. Accessed November 2015. http://www.deq.louisiana.gov/portal/HOME.aspx

[3] *Louisiana Department of Natural Resources*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=9&pnid=0&nid=3

[4] *Louisiana Oil Spill Coordination Office*. Web. Accessed November 2015. http://www.losco.state.la.us/index.html

[5] *Coastal Protection and Restoration Authority*. Web. Accessed November 2015. http://coastal.la.gov/about/

[6] "Marine Environmental Protection Program" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/top/missions/marineenvironmentalprotection.asp

[7] "Emergency Management" *Environmental Protection Agency.* Web. Accessed November 2015. http://www.epa.gov/emergencies/

[8] "Mississippi River/Gulf of Mexico Hypoxia Task Force" *Environmental Protection Agency*. Web. Accessed December 2015. http://www.epa.gov/ms-htf

[9] *NOAA Office of Response and Restoration*. Web. Accessed November 2015. http://response.restoration.noaa.gov/

[10] "Environmental Contaminants Program" *U.S. Fish and Wildlife Service*. Web. Accessed November 2015. http://www.fws.gov/contaminants/Issues/OilSpill.cfm

[11] "Natural Resource Damage Assessment" *Louisiana Oil Spill Coordinators Office*. Web. Accessed November 2015. http://www.losco.state.la.us/nrda.html

[12] *Restore the Gulf*. Web. Accessed November 2015. http://www.restorethegulf.gov/

[13] "Gulf Environmental Benefit Fund in Louisiana" *National Fish and Wildlife Foundation*. Web. Accessed November 2015. http://www.restore.ms/national-fish-and-wildlife-foundation/

7.2.2 (g)(i) - Have pollution and waste been minimized?
Yes... [1] Some... [½] No...[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: U.S. fisheries are governed by USCG regulations that aim to minimize environmental impacts including pollution and waste and comply with international MARPOL regulations.[1] **Louisiana:** Louisiana law also addresses waste and pollution through state regulations set forth in the Louisiana Administrative Code, Title 33- Environmental Regulatory Code.[2] LDEQ is the agency responsible for providing "service to the people of Louisiana through comprehensive environmental protection in order to promote and protect health, safety and welfare while considering sound policies regarding employment and economic development."[3] LDEQ creates and enforces regulations regarding clean air, clean water and safe management of waste.		

[1] "Environmental Standards Division" *United States Coast Guard*. Web. Accessed November 2015. https://homeport.uscg.mil/mycg/portal/ep/channelView.do?channelId=-18361&pageTypeId=13489

[2] La. Admin. Code, Title 33 (Environmental Regulatory Code) http://www.deq.louisiana.gov/portal/DIVISIONS/LegalAffairs/RulesandRegulations/Title33.aspx

[3] *Louisiana Department of Environmental Quality*. Web. Accessed November 2015. http://www.deq.louisiana.gov/portal/

7.2.2 (g)(ii) - Has catch by lost and abandoned gear of commercial species and other organisms been minimized? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Since gear remains attached to the vessel while actively fishing, typically damaged gear is recovered and repaired, if possible. The original Gulf of Mexico Shrimp FMP (1981) notes that one of the problems identified in the fishery is "loss of gear and trawling grounds due to man-made underwater obstructions" and Goal 7 of the FMP is to "minimize adverse effects of underwater obstructions to shrimp trawling".[1] Measure 10 of the Shrimp FMP adopted by the council is "The GMFMC will attempt to reduce, where feasible, the loss of offshore trawlable bottom by establishing within GMFMC a committee to monitor and review construction of offshore reefs, with attention to the needs of reef fish, and shrimp user groups." The Texas Sea Grant program developed guide books for shrimp vessels in the Gulf of Mexico documenting bottom obstructions and areas to avoid trawling due to potential interactions.[2,3] Most vessels have utilized these books, and in more recent years, other technologies that help track sea floor obstacles that may interfere with trawl gear. Trawls used in federal waters are also required to have a weak link in the tickler chain that makes contact with the bottom, which is designed to break away to prevent gear from entanglement.[4] The Louisiana Shrimp FMP objective 7 is to "minimize adverse effects of underwater obstructions on shrimp trawling."[5] Interactions with underwater obstructions cause damage to shrimp trawl which could result in gear loss as well as financial loss to shrimpers. Placement of oyster lease markers; buoys, cables, and recorders for geoseismic surveys; hurricane debris; lost or abandoned oil industry equipment; and gear from trap fisheries are all potential obstructions to shrimp trawls in the Gulf of Mexico. Louisiana developed the Louisiana Underwater Obstruction Removal Program administered by the LDNR to address growing concerns over natural and manmade obstructions in navigable waters.[6] The program is designed to identify and remove underwater obstructions in state waters.[7]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] Gary Graham, David Veal, and Bill Hosking. *"Hangs" and Bottom Obstructions of the Mississippi/Alabama Gulf*. TAMU-SG-83-505. Texas Sea Grant, 1983 http://texasseagrant.org/assets/uploads/publications/1983/83-505.pdf

[3] Gary Graham. *Bottom Fishing Obstructions: Texas/Louisiana Gulf*. TAMU-SG-76-502. Texas Sea Grant. 1975. http://texasseagrant.org/assets/uploads/publications/1976/76-502.pdf

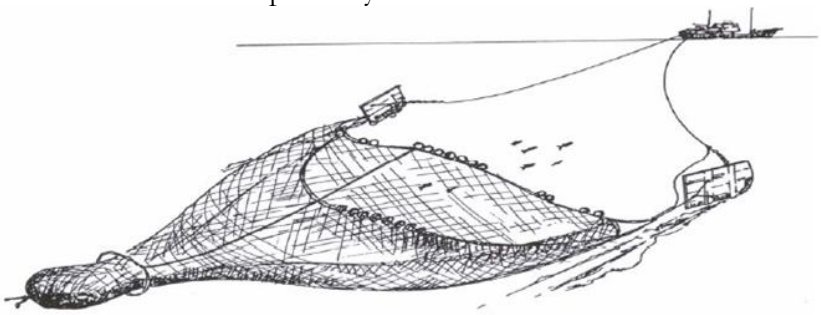
[4] U.S. 50 CFR §622.9 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_19

[5] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.8. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[6] Bourgeois et al., 2015. p.39.

[7] *Louisiana Department of Natural Resources*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=433&pnid=26&nid=284

7.2.2 (g)(iii) - Have selective and environmentally-safe and cost-effective fishing methods been developed? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
	The primary gear types in the Louisiana commercial shrimp fishery are otter trawls, skimmer trawls, and butterfly nets.[1,2] There is occasional use of cast nets, but documentation of commercial catch with this gear is very small and chopstick nets were banned in both inshore and offshore waters in Louisiana in 1984.[3] **<u>Otter trawls</u>:** The basic otter trawl is the most common gear type used in offshore waters.[4] Otter trawls were introduced in the shrimp fishery in 1917 and became the dominant gear type of the Gulf of Mexico shrimp fishery.  Figure 3 Otter Trawl In the offshore fleet, several configurations of otter trawls have been developed and used over time. From 1917-1940s, the single rig (shown above) was the main style, and is still in use in inshore fisheries. In the 1950s as shrimping moved further offshore, the double rig was developed which utilizes two smaller nets instead of one large net, which increased efficiency and reduced handling problems. More recently, the twin trawl system has become popular, which utilizes four small trawls (one twin trawl on each side of the boat from the outriggers). Studies on twin trawl design show increased catch efficiency, leading to reduced trip time and higher quality, and reduced fuel consumption.[5] Federal regulations require the use of TEDs in all otter trawls in the shrimp fishery in	

both state and federal waters to reduce sea turtle capture.[6] Federal regulations requiring TEDs in all otter trawls for the shrimp fishery first went into effect in 1989.[7] TEDs are not 100% effective; certified TED designs are required to meet a 97% efficiency rate for turtle exclusion within a 5 minute period. Current certified TEDs in use; therefore, are effective in allowing the escape of most, but not all, turtles caught within shrimp trawls. Turtle mortality has decreased significantly since the implementation of TEDs and most sea turtle populations show signs of rebuilding. Maintaining compliance rates and TED effectiveness above the 88% effectiveness threshold set by the 2014 Biological Opinion requires continuous efforts throughout the fishery.

Federal regulations also require the use of BRDs in all shrimp trawls fishing in federal waters to reduce the incidental catch of various finfish species.[8] Amendment 9 first required the use of BRDs in shrimp trawls west of Cape San Blas, FL in the U.S. EEZ for the purpose of reducing juvenile red snapper bycatch.[9] State waters were not considered a factor because it was determined that juvenile red snapper typically occur beyond depths of 5 fathoms, and mainly occurred beyond 10 fathoms (80-83% occurrence below 10 fathoms).[10]Amendment 10 followed, requiring BRDs in shrimp trawls east of Cape San Blas to reduce total finfish bycatch by 30% as required by the MSA bycatch reduction requirements.[11]
Many of the typical species caught in shrimp trawls are highly productive, short-lived species with high resilience to fishing pressure.
Common species caught in shrimp trawls include:

- Atlantic croaker (*Micropogonias undulates)*
- Seatrouts (*Cynoscion sp.*)
- Longspine porgy (*Stenotomus caprinus*,)
- Inshore Lizardfish (*Synodus foetens*)

Based on a recent analysis by Raborn et al. (2014) these are the only finfish species and genus that represent 5% or higher in bycatch of shrimp trawls. Analysis of these species indicates that shrimp trawl bycatch does not pose a threat to any of these species.[12]

Louisiana does not require the use of BRDs in state waters, as is required in federal waters. There is currently no observer coverage on otter trawls within state waters and data on bycatch is limited to previous studies. Adkins (1993) conducted bycatch studies on shrimp vessels in Louisiana waters, sampling offshore, inshore, and "wingnet" (butterfly nets) to characterize and compare bycatch ratios of the different areas and gear types.[13] The Adkins study provides bycatch information prior to the widespread use of BRDs. Adkins (1993) found the overall average bycatch ratio to be 3.21:1 and notes that inshore vessels typically had higher bycatch estimates (3.0:1) than offshore vessels (2.2:1), but that bycatch ratios varies significantly by area, time of day, gear type and size of net. Species composition of bycatch, in order of quantity, was bay anchovy (12%), Gulf menhaden (5%), sand seatrout (4%), Atlantic croaker (3.5%), sea catfish (2.3%), blue crab (2.5%), seabobs (1%), and spot (1%). This composition is generally consistent with early studies cited in the Adkins report, and more recent studies such as Scott-Denton et al. (2012). Adkins also notes that no popular commercial or recreational finfish species were present in significant amounts in bycatch, and the common bycatch species found in this study showed no indication of serious impacts from bycatch removals. Since the development of BRDs in the 1990s and federal

	regulations requiring BRDs in offshore fisheries, many fishermen have also adopted use of these devices within state waters to decrease culling time and increase quality of target catch. Many shrimp fishermen in Louisiana waters now often use BRDs voluntarily, which has potentially reduced the overall bycatch ratio in state waters since the Adkins report; however, no recent studies are available to confirm this. Additionally, shrimpers in Louisiana are allowed to retain and sell most bycatch if they are in compliance with regulations for each species.[14] The SEFSC Pascagoula Lab contains the Harvesting Systems Unit, which is a team of gear specialists and fishery biologists performing research into critical problems relating to commercial and recreational fishing gear to inform and improve fisheries resource management.[15] The Harvest Systems Unit is responsible for the development, evaluation, certification, and national and international technology transfer of TEDs for trawling gear. The Harvesting Systems Unit is also responsible for the development and assessment of BRDs to reduce finfish bycatch in shrimp trawls. Research on TEDs and BRDs for the shrimp fishery is ongoing with annual testing on new designs of these devices to improve efficiency in reducing bycatch and minimizing shrimp loss and studies are conducted both independently, and in collaboration with commercial shrimpers through cooperative research projects. There are currently several certified designs of both TEDs and BRDs approved by the NOAA.[16,17] Members of the Harvesting Systems Unit also conduct courtesy inspections of TEDs and BRDs installed on shrimp boats during dock visits, workshops and upon request to ensure that these devices are properly used. **<u>Skimmer trawls</u>:** Skimmer trawls were first developed in Louisiana in the early 1980s and over time have also gained popularity in inshore waters of Mississippi and Alabama. Skimmer trawls are highly effective gear in the relatively shallow levels of Louisiana inshore waters. Skimmer trawls are held in place by a frame mounted on the vessel just behind the bow and are pushed through the water, rather than towed behind the vessel like an otter trawl. This allows the vessel to continue to move while the cod end of the trawl is retrieved and emptied, which may be done as often as every 30 minutes.	

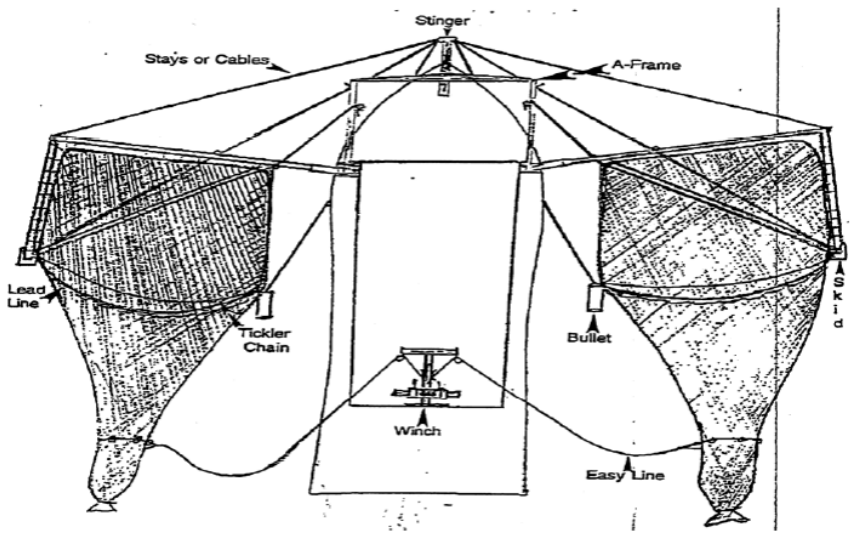


Figure 5 Skimmer Trawl

Currently, federal regulations require either the use of a TED in skimmer nets, or adherence to strict tow times (maximum 55 minutes from April 1 to October 31, and 75 minutes from November 1 to March 31) to reduce sea turtle capture and drowning within skimmer nets.[18] Observer coverage on the skimmer fleet from 2012 through 2014 indicates that compliance with tow-time restricts has ranged from 29% (2014) to 38% (2013) compliant, indicating that over 60% of tows throughout the 3 years of study have exceeded tow time limits.[19]

In 2012, NOAA proposed a regulation change requiring the use of TEDs in skimmers; however, research indicated that the majority of turtles (58%) captured in skimmer trawls during observer coverage in 2012 were small enough to pass through the current 4" TED design. These data caused NOAA to repeal the proposed rule over concern that current TEDs would not efficiently exclude turtles caught using skimmers in the inshore fleet and NOAA began research on new TED designs to address this problem. NOAA is currently actively researching new TED designs to exclude smaller turtles, and outreach efforts are underway to increase awareness of tow time requirements to improve compliance with the current regulations. Several fishermen in the skimmer trawl fleet in Louisiana do use TEDs voluntarily. Annual reports from the Observer Program indicate that approximately 5% of vessels carrying observers are equipped with TEDs. [20,21,22]

Several studies have indicated that bycatch in skimmer trawls is substantially lower than bycatch in traditional otter trawls.[23] Hein and Meier (1995) discuss the development of the skimmer trawl in Louisiana, which began around 1983 in the Barataria area primarily for use during white shrimp season.[24] Hein and Meier (1995) found that the advantages of skimmer trawls, including increased shrimp catch (for white shrimp), less debris and bycatch, lower fuel consumption and easier maneuverability in shallow water all lead to popularization of skimmer use in Louisiana waters. Since the cod end can be retrieved while the net remains in the water fishing, nets are checked and emptied more frequently leading to less bycatch and higher survivability of discards as well as

increased quality of retained catch. Early studies of bycatch in skimmer trawls in North Carolina by Coale et al. (1994) comparing skimmer trawls to otter trawls found that skimmers typically caught less bycatch than otter trawls during white shrimp season and bycatch in skimmers had significantly higher survivability rates.[25] The authors found that this was not the case for brown and pink shrimp season. More recently, Scott-Denton et al. (2007) conducted skimmer bycatch study using a voluntary observer program on inshore vessels in Louisiana in 2004-2005.[26] Findings indicated that the discards to landings ratio was .63 and main bycatch species consisted of Gulf menhaden (8%), blue crab (7%) and Atlantic croaker (2%). In 2012, a mandatory observer program was implemented for the northern Gulf skimmer fleet in Louisiana, Alabama, and Mississippi. The annual observer reports indicate the bycatch ratio for skimmers ranges from .92 to 1.94.[27,28,29] These reports also document voluntary use of BRDs in skimmers and indicate that over 40% of shrimpers voluntarily use BRDs.

Butterfly Nets:

The Louisiana Shrimp FMP states that butterfly nets only account for about 3% of catch.[30] Hein and Meier (1995) notes that 'wingnets' (butterfly nets) were introduced in Louisiana waters in 1950's and are typically used on stationary platforms or on shrimp boats either anchored or moving.[31] The butterfly net consists of a rectangular metal frame which forms the mouth of the net and webbing is attached to the frame and tapers to a cod end. The net is set in a tidal flow and typically held stationary or moving slowly into the current and are used almost exclusively in tidal passes with strong outgoing tides. Butterfly nets are also exempt from TED requirements, similarly to skimmer trawls, and must adhere to tow time limits. Epperly et al. (2002) states that butterfly nets may be less likely to interact with sea turtles because they are fished off the bottom.[32]

BOTTOM HABITAT IMPACTS:

Shrimp trawling can also cause damage to the sea floor by burying, exposing, or injuring marine organisms and submerged vegetation and may also impact ecosystem by resuspension of sediments and release of nutrients into the water column. The shrimp trawl fishery in the northern Gulf of Mexico primarily trawls with smaller nets and is active mainly in mud, sand or peat bottoms in areas that are storm-prone and typically experience habitat disturbances from natural causes as well as other anthropogenic activities. Chang et al. (2001) examined resuspension of sediments during hurricane events and determined that impacts occur to depths beyond 70 meters.[33] Typical shrimp trawling activities occur in shallower depths, generally above 30 meters. Dellapenna et al. (2006) determined that the turbidity plume following a shrimp trawl was comparable to the turbidity produced by a 9 to 10 m/s wind event at the study area in Galveston Bay, TX.[34] The degree to which bottom trawls disturb sediment depends on the sediment type and the gear type, weight and speed. There are wide-ranging results from previous trawl impact studies possibly due to differences in trawl methods, gear and/or habitat type; however, since trawl gear is designed to maintain contact with the seabed, some level of resuspension and sediment penetration is inevitable. An understanding of ecological effects is dependent on the site-specific characteristics such as bottom type, depth, community type, gear and methods used and the intensity of activity and other natural disturbances. Recovery of trawled substrate is also dependent on sediment type, depth, and natural influences. Few studies

	have focused on habitat recovery after trawl impacts and most existing studies have not addressed cumulative impacts of repeated trawling occurrences that would be typical of commercial fishing over time.[35] NRC (2002) reported that, based on rough estimates of the number of times a given area was swept, the Gulf of Mexico was one of the areas of highest intensity of effort.[36] NRC (2002) also notes that a significant reduction in effort has occurred in many areas due to area closures, seasonal closures and gear restrictions. A study by Jennings and Kaiser (1998) found it plausible that light shrimp trawls likely do not cause significant disturbance to shallow water communities in poorly sorted sediments. Additionally, they note that organisms in soft mud are capable of burrowing up to two meters deep and are likely not impacted by passing trawls.[37] Dellapenna et al. (2006) conducted studies on the impact of shrimp trawling in Galveston Bay, Texas and found that the maximum depth excavated by trawl gear was 1.5 cm.[38] Sanchez et al. (2000) similarly found that sporadic episodes of trawling in muddy habitats "may cause relatively few changes in community composition" and that "natural variability at some sites may exceed the effects of disturbance from fishing" and Ball et al. (2000) notes that epifauna are generally scarce in muddy sediment habitats.[39] Barnette (2001) additionally found that skimmer trawls likely have less impact than otter trawls due to the absence of trawl doors interacting with the floor bottom. However, skimmer trawls, are typically active in shallower waters (10 feet) and may interact more with sensitive habitats such as submerged aquatic vegetation (SAV). Impacts on EFH have been assessed by NOAA and the GMFMC in the Generic Amendment for addressing EFH requirements in FMPs. The EFH amendment applies to all seven GMFMC FMPs.[40] The Initial EFH amendment was developed in 1998 and included an EIS. Section 5.1 identifies EFH for the shrimp species managed in the Gulf of Mexico Shrimp FMP (brown, white, pink, and royal red). Section 6.1 identifies fishing-related threats, 6.2 identifies non-fishing related threats. Section 7 provides management options to minimize impacts and Section 8 identifies research needs. The EFH amendment is reviewed and updated every five years. The 2005 EFH Amendment 3 recommends the following management measures related to the shrimp fishery to minimize impacts:[41] 1. Prohibit use of trawl gear, bottom longlines, buoy gear and traps on coral reefs in the EEZ (includes East and West Flower Garden Banks, McGrail Bank, Pulley Ridge, North and South Tortugas Ecological Reserve, and coral communities in Stetson Bank) 2. Require a weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf of Mexico EEZ. These recommendations were adopted into regulation by NOAA Fisheries.[42] The EFH review in 2010 found that effort in all commercial fisheries had declines between 2000 and 2008, and that no new recommendations were necessary.	

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. page 23. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[3] Stephen Hein and Paul Meier, 1995. "Skimmers: Their Development and Use in Coastal Louisiana" *Marine Fisheries Review, 57(1*), 1995. http://spo.nmfs.noaa.gov/mfr571/mfr5712.pdf

[4] LDWF. (date unknown) *Louisiana Trawl Gear Characterization*. NOAA Fisheries. http://www.nmfs.noaa.gov/pr/pdfs/strategy/la_trawl_gear.pdf

[5] Twin Trawl design study http://www.crimond.com/twintrawlreport.htm

[6] 50 CFR § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[7] "History of Turtle Excluder Devices (TEDs)" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/history.htm

[8] U.S. CFR Title 50 §622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[9] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[10] Nichols, Scott. *The spatial and temporal distribution of the bycatch of red snapper by the shrimp fishery in the offshore waters of the US Gulf of Mexico*. Pascagoula, Mississippi: National Marine Fisheries Service, Mississippi Laboratories, 1990.

[11] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2002. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[12] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[13] Gerald Adkins. *A Comprehensive Assessment of Bycatch in the Louisiana Shrimp Fishery.* Technical Bulletin No. 42. Louisiana Department of Wildlife and Fisheries. 1993

[14] Bourgeois et al., 2015. p.40.

[15] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[16] "TED Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/designs.htm

[17] "BRD Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/brd/designs.htm

[18] 50 CFR 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[19] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[20] Pulver, J. R., E. Scott-Denton, and J. A. Williams. "Characterization of the US Gulf of Mexico skimmer trawl fishery based on observer coverage." *NOAA Technical Memorandum NMFS-SEFSC* 636 (2012): 27. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2012_skimmer_trawl_observer_report.pdf

[21] Pulver, Jeffrey R., Elizabeth Scott-Denton, and Jo A. Williams. "Observer coverage of the 2013 Gulf of Mexico skimmer trawl fishery." *NOAA Technical Memorandum NMFS-SEFSC* 654 (2014): 25. http://www.sefsc.noaa.gov/turtles/TM_NMFS_SEFSC_654_Pulver_etal_skimmer.pdf

[22] Scott-Denton et al., 2014

[23] Bourgeois et al., 2015.

[24] Stephen Hein and Paul Meier. "Skimmers: Their Development and Use in Coastal Louisiana." *Marine Fisheries Review 57(1),* 1995 http://spo.nmfs.noaa.gov/mfr571/mfr5712.pdf

[25] J. Stuart Coale, Roger Rulifson, James Murray, and Robert Hines. "Comparisons of Shrimp Catch and Bycatch between a Skimmer Trawl and an Otter Trawl in the North Carolina Inshore Shrimp Fishery." *North American Journal of Fisheries Management* 14:751-768. 1994 https://www.researchgate.net/profile/Roger_Rulifson/publication/254310611_Comparisons_of_Shrimp_Catch_and_Bycatch_between_a_Skimmer_Trawl_and_an_Otter_Trawl_in_the_North_Carolina_Inshore_Shrimp_Fishery/links/5422d5610cf26120b7a60347.pdf

[26] Coale et al., 1994

[27] Scott-Denton et al., 2014.

[28] Pulver et al., 2012.

[29] Pulver et al., 2014.

[30] Bourgeois et al., 2015. p. 20-21.

[31] Hein and Meier, 1995

[32] Epperly, S., L. Avens, L. Garrison, T. Henwood, W. Hoggard, J. Mitchell, J. Nance, J. Poffenberger, C. Sasso, E. Scott-Denton, and C. Yeung. 2002. *Analysis of sea turtle bycatch in the commercial shrimp fisheries of southeast U.S. waters and the Gulf of Mexico*. U.S. Department of Commerce, NOAA Technical Memorandum NMFSSEFSC-490. page 75. http://www.sefsc.noaa.gov/turtles/TM_490_Epperly_etal.pdf

[33] G. C. Chang, T. D. Dickey, and A. J. Williams III. "Sediment Resuspension over a continental shelf during Hurricanes Edward and Hortense." *Journal of Geophysical Research, Vol. 106, No. C5*. May 2001 http://onlinelibrary.wiley.com/doi/10.1029/2000JC900032/pdf

[34] Dellapenna et al., 2006 as cited in GMFMC. *5-Year Review of the Final Generic Amendment Number 3 Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the Fishery Management Plans of the Gulf of Mexico*. October 2010. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/EFH%205-Year%20Review%20Final%2010-10.pdf

[35] Michael C. Barnette. *A review of the fishing gear utilized within the Southeast Region and their potential impacts on essential fish habitat*. NOAA Technical Memorandum NMFS-SEFSC-449. February 2001 http://www.safmc.net/managed-areas/pdf/Barnettegear.pdf

[36] National Research Council. *Effects of Trawling and Dredging on Seafloor Habitat*. Washington, DC: The National Academies Press, 2002. doi:10.17226/10323
http://www.arrancoast.com/science/effects_of_trawling_and_dredging_on_seafloor_habitat.pdf

[37] Simon Jennings and Michel Kaiser. "The Effects of Fishing on Marine Ecosystems" *Advances in Marine Biology*. January 1998.
http://www.researchgate.net/profile/Michel_Kaiser/publication/222490649_The_Effects_of_Fishing_on_Marine_Ecosystems/links/0fcfd50af7a1a0577a000000.pdf

[38] Dellapenna et al., 2006

[39] Sanchez et al., 2001 and Ball et al., 2001 as cited in Barnette, 2001 http://www.safmc.net/managed-areas/pdf/Barnettegear.pdf)

[40] "Essential Fish Habitat Amendments" *Gulf of Mexico Fishery Management Council*. Web. Accessed November. 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

[41] GMFMC. *Generic Amendment Number 3 for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 2005. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINAL3_EFH_Amendment.pdf

[42] 50 CFR § 622.15 (coral protection) and § 622.9 (prohibited gear)
http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

7.2.3 Have the impacts of environmental factors on target species and those species associated with, dependent on, or belonging dependent on the target stocks, been assessed?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Environmental influences are a significant factor in the population dynamics of the three penaeid shrimp species (brown, white and pink) managed under the federal Shrimp FMP. The original Shrimp FMP implemented in 1981 states "each year's take of brown, white, and pink shrimp will be heavily influenced by water salinity and temperature during critical periods of estuarine shrimp growth", and found that the critical determinant of shrimp production is estuarine environmental conditions.[1] Griffen et al. (1976) attempted to determine yield as a function of discharge from the Mississippi River, which highly impacts salinity and temperature of primary estuarine habitats in the northern Gulf of Mexico.[2] Tropical storms and heavy rainfall are also noted as significant environmental factors effecting shrimp populations. The SEFSC Galveston Lab recently conducted a study on temperature and salinity effects on growth and survival of white and shrimp in relation to freshwater inflow and potential implications of river diversions.[3] Environmental impacts in relation to target and non-target species are addressed in the EAs and EISs prepared for each FMP and amendments.[4] The original Shrimp		

FMP contains predator and prey information for each penaeid shrimp species. The EFH Generic Amendment (applied to all Gulf of Mexico FMPs) and accompanying EIS also contain detailed information on the shrimp fishery habitat needs, environmental factors, prey dependence, biological and environmental impacts of fishing methods.[5,6] During the larval stage, shrimp feed on phytoplankton and zooplankton. Postlarval shrimp migrate into estuaries where they become bottom feeders and typically feed on epiphytes, detritus, and algae. Juveniles and adults become more predatory and often prey on polychaetes, amphipods, nemotodes, and chironomid larvae, but also continue to feed on detritus and algae. Penaeid shrimp are preyed upon by a wide variety of finfish species. Primary predators include black drum, redfish, speckled trout, southern flounder, Atlantic croaker, bass and several species of catfish. Many of these species are also common bycatch in the shrimp fishery. These species are monitored through independent sampling programs including annual SEAMAP resource surveys conducted by the NOAA SEFSC Pascagoula Lab.[7,8] The Summer and Fall SEAMAP Shrimp/Groundfish Surveys are designed to monitor size, abundance and distribution of demersal species, including penaeid shrimp in the Northern Gulf of Mexico from inshore waters out to 60 fathoms. Sampling is conducted across all five Gulf states using standardized methodologies and records data on all species caught and environmental parameters at each sampling site. All data from SEAMAP surveys is entered into the SEAMAP Information System, which contains a consistent dataset starting in 1982, and data are available to all participating agencies and to the public upon request. **Louisiana:** LDWF monitors the effects of environmental factors on target species and associated species through their fishery independent monitoring program. The fishery independent monitoring program in Louisiana was initially developed based on the methodologies utilized by the Cooperative Gulf of Mexico Estuarine Inventory and Study (GMEI) conducted in cooperation with the GSMFC.[9] The standardized methods and procedures of GMEI were developed by the GSMFC TCC. The Louisiana coast is divided into five hydrological basins for monitoring activities and regular sampling is conducted monthly with additional sampling added seasonally for specific needs.[10] Shrimp abundance, using several types of trawl gear, is sampled throughout the year along with environmental and hydrological data at each sampling site. The database of trawl sampling for shrimp by the Marine Fisheries Section dates back to the 1960s.[11] Louisiana also participates in the regional sampling programs including SEAMAP, which provide additional fishery independent data to enhance scientific evidence used in management decisions.[12]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] Griffen et al. as cited in GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://gulfcouncil.org/docs/amendments/SHRIMP%20FMP%20Final%201981-11.pdf

[3] "Fishery Ecology" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_ecology/currentresearch/caernarvon/index.html

[4] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[5] GMFMC. *Generic Amendment for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 1998. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINALEFH-%20Amendment%201-%20no%20appendices.pdf

[6] GMFMC. Final Environmental Impact Statement *Generic Amendment for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 2004. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20EFH%20EIS.pdf

[7] "Southeast Area Monitoring and Assessment Program(SEAMAP)" *NOAA Fisheries*. Web. Accessed November 2015.http://sero.nmfs.noaa.gov/operations_management_information_services/state_federal_liaison_branch/seamap/index.html

[8] "SEAMAP Gulf of Mexico Resource Surveys" *Southeast Area Monitoring and Assessment Program*. Web. Accessed Nov. 2015. http://www.gsmfc.org/seamap-gomrs.php

[9] SEDAR 27-RD-06 "Fishery Independent Sampling: Louisiana" Southeast Data, Assessment, and Review. http://sedarweb.org/docs/wsupp/S27_RD_06_LDWF_independent.pdf

[10] LDWF. *Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs*. June 2015

[11] LDWF, June 2015

[12] Bourgeois et al., 2015. p. 15.

7.3 Management framework and procedures

7.3.1 (a) Have the management measures developed taken into account the whole stock unit over its entire area of stock distribution? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
The federal Shrimp FMP implemented in 1981 determined the stock unit for the three penaeid shrimp species (brown, white and pink) to be the area of U.S. waters of the Gulf of Mexico bounded on the east side by a natural biological break in fauna on the southeast coast of Florida, and bounded on the west side by the political boundary with Mexico.[1] Detailed information on shrimp stocks and harvest in Mexican waters has not been available at the time of assessments by NOAA Fisheries; therefore, the assumption is made that shrimp moving across international boundaries between the U.S. and Mexico flows equally in both		

directions, and stocks are assessed and managed only for U.S. waters.[2] While NOAA Fisheries only regulates the fishery within federal waters, the GMFMC contains representatives from each of the five Gulf states, and the federal Shrimp FMP developed by the GMFMC considers all state management measures when determining goals and actions for the federal FMP. Objective 3 of the FMP is to "coordinate the development of shrimp management measures by the GMFMC with the shrimp management programs of the several states, where feasible." Several actions have been taken since the initial implementation of the FMP to coordinate federal and state measures including adjustment, implementation, and repeal of certain minimum size regulations to create consistency across management areas, and implementation of area and seasonal closures coordinated between state and federal waters. Louisiana participates in the GMFMC process and manages the shrimp fishery in state waters consistent with the GMFMC Shrimp FMP and federal regulations.		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] James Nance. Stock Assessment *Report 2008 Gulf of Mexico Shrimp Fishery*. NMFS SEFSC Galveston Lab. October 2008. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/BB%202009-10/D%20-%204%20Stock%20Assessment%20Report%20GOM%20Shrimp%20Fishery.pdf

7.3.1 (b) Have previously-agreed management measures established and applied in the same region been considered? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC considers a set of alternatives for each management action when determining measures for the Gulf of Mexico shrimp fishery.[1] Each FMP and amendment contains the full set of alternatives for each action with a discussion of the options and a rationale for the preferred alternative that is selected. Alternatives are developed using a wide range of sources, including management measures that have been established and applied in the region by state management agencies as well as measures applied in the South Atlantic shrimp fishery. Some examples include: - A cooperative closure with the state of Texas has been established. Federal EEZ waters adjacent to Texas are closed annually in conjunction with Texas state territorial waters to protect small brown shrimp migrating from estuaries out into the Gulf.[2] - A minimum size requirement for white shrimp landed in Louisiana. Since Louisiana maintains a minimum size limit for white shrimp in state waters, federal regulations also require that white shrimp caught in the EEZ must meet the minimum size limits set in Louisiana if landed in Louisiana ports.[3]		

Louisiana: LDWF has considered all management measures that are utilized by the GMFMC and NOAA Fisheries and the other Gulf State agencies and has implemented several regulations based on coordination with these organizations. LDWF participates in the GMFMC process and manages the shrimp fishery consistent with the federal Shrimp FMP.		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[3] 50 CFR § 622.56
http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

7.3.1 (c) Have all removals and the biological unity and other biological characteristics of the stock been considered? ***Yes...***[1] ***Some…***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**

Federal:

As noted in the draft Amendment 15 to the GMFMC Shrimp FMP- "The biological characteristics that affect sustainable yields for penaeid shrimp are unusual. They are an annual crop."[1] Few individuals survive beyond one year and harvest is primarily on the 0-year class. No stock-recruitment relationship has been determined for the three penaeid shrimp species (brown, white, pink) in the Gulf, and recruitment overfishing is considered not to be possible given economic and technological capabilities of the fishery. "Because of these characteristics, MSY is essentially all the shrimp available to harvest, using current technology." Abundance greatly varies on an annual basis dependent on temperature and salinity condition in estuaries.

In originally determining MSY for the three penaeid shrimp species in the initial Shrimp FMP, a Schaefer model was used to determine MSY based on commercial estimates, then modified to consider environmental factors.[2] Estimates of recreational and bait fishery harvest, and discards are also added to establish a maximum probable catch for each species.

	Maximum Commercial Yield based on Schaefer model and environmental influences	Recreational	Bait	Discard	Total
Brown shrimp	117 million pounds of tails	8	2	5	132
White Shrimp	52 million pounds of tails	8	1	3	64
Pink shrimp	19 million pounds of tails	0	1	0	20
All 3 species combined					216

[1] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[2] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

7.3.1 (d) Has the best scientific evidence available been used to determine, inter alia, the area of distribution of the resource? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
The MSA NS2 requires that the best available science be used when establishing conservation and management measures.[1] The GMFMC ensures this through rigorous review of the science and data used to inform management decisions by the SSC. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[2] In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf states.[3] The SEFSC Galveston Lab shrimp fishery research program continues to research and maintain the best available science for use in stock assessments and management of the Gulf of Mexico shrimp fishery.[4] Stock assessments and other scientific reports by the Galveston Lab are reviewed by the GMFMC SSC and Special Shrimp SSC to confirm that they meet the requirement of best available science. The original Shrimp FMP developed by GMFMC contains detailed information on the stocks, areas of distribution, and biological characteristics of the species under management within the plan. The FMP contains the following information for brown and white shrimp:[5] - Brown shrimp: range from along the north Atlantic and Gulf of Mexico Coast from Martha's Vineyard, Massachusetts, to the northwestern coast of the Yucatan. The range is not continuous but is marked by an apparent absence of brown shrimp along Florida's west coast between the Sanibel and the Apalachicola shrimping grounds. (Perez Farante, 1969). Highest catches in the Gulf of Mexico are found along the Texas, Louisiana, and Mississippi coasts. Mark-recapture studies have been conducted on brown shrimp populations in the Gulf and indicate mixing of populations along the north central and northwestern Gulf coast. (Gunter, 1962) - White shrimp: range along the Atlantic coast from Fire Island, New York, to Saint Lucie inlet, Florida, and along the Gulf coast from the mouth of the Ochlachonee River, Florida to Campeche. There are two centers of		

abundance in the Gulf: one along the Louisiana coast and one in the Campeche area (Perez Farante, 1969). Additionally, the EFH Amendment includes detailed descriptions of all habitats in the Gulf of Mexico utilized by each shrimp species throughout its life cycle, and defines EFH for each species.[6]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] 50 CFR §600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[3] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[6] "Essential Fish Habitat Amendments" Gulf of Mexico Fishery Management Council. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

7.3.1 (f) Has the area through which the species migrates during its life cycle been considered?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
The life cycles of the penaeid shrimp species found in the Gulf of Mexico are complex and include migration through several different environments. Detailed information on the biology and life cycle of brown and white shrimp is contained in the GMFMC Shrimp FMP.[1] Adults typically spawn in the Gulf of Mexico, where fertile eggs hatch into free-swimming larvae. Larval shrimp go through several molts during this free-swimming pelagic stage. During the postlarval stage, shrimp enter estuarine environments and become bottom feeders. Within estuaries, juvenile shrimp typically feed within the marshwater interface or submerged grass beds where there are high concentrations of food supply (detritus, algae, microfauna) and greater protection from predators. The wetland zone is an important component of shrimp habitat because the salinity regimes critical to shrimp growth occur in these areas. As shrimp grow larger (typically between 2.75-4.7 inches), they move to deeper waters and emigrate out into the Gulf of Mexico. This emigration is influenced by tide, temperature, and size. Adult white and brown shrimp prefer soft mud or peat bottoms that contain large amounts of vegetation or decaying matter. Brown shrimp are typically found in mud, sand or shell bottoms and some juvenile brown shrimp may be found in sand or clay bottom. White shrimp prefer muddy or silty bottoms, and are sometimes found in sand or clay bottom that contain fragments of shell.		

White shrimp predominantly occur in depths shallower than 20 fathoms, and brown shrimp are typically found at depths greater than 20 fathoms. Additionally, the EFH Amendment includes detailed descriptions of all habitats in the Gulf of Mexico utilized by each shrimp species throughout its life cycle, and defines EFH for each species.[2]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] "Essential Fish Habitat Amendments" Gulf of Mexico Fishery Management Council. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

7.3.2 In the case of a transboundary, straddling and highly migratory fish stock or high seas fish stock throughout its range, are the conservation and management measures established for such stock within the jurisdiction of the relevant States, or the appropriate subregional, regional fisheries management organizations and arrangements, compatible? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
Federal: NOAA Fisheries and the GMFMC are responsible for management measures within the federal EEZ waters of the Gulf of Mexico. Each individual state is responsible for management of the fishery within its own territorial waters (FL and TX: out to nine nautical miles; LA, MS, AL: out to three nautical miles). The federal Shrimp FMP implemented in 1981 determined the stock unit for the three penaeid shrimp species (brown, white and pink) to be the area of U.S. waters of the Gulf of Mexico bounded on the east side by a natural biological break in fauna on the southeast coast of Florida, and bounded on the west side by the political boundary with Mexico.[1] Detailed information on shrimp stocks and harvest in Mexican waters has not been available at the time of assessments by NOAA Fisheries; therefore, the assumption is made that shrimp moving across international boundaries between the U.S. and Mexico flows equally in both directions, and stocks are assessed and managed only for U.S. waters.[2] While NOAA Fisheries only regulates the fishery within federal waters, the GMFMC contains representatives from each of the five Gulf states, and the federal Shrimp FMP developed by the GMFMC considers all state management measures when determining goals and actions for the federal FMP. Objective 3 of the FMP is to "coordinate the development of shrimp management measures by the GMFMC with the shrimp management programs of the several states, where feasible." Several actions have been taken since the initial implementation of the FMP to coordinate federal and state measures including adjustment, implementation, and repeal of certain minimum size regulations to create consistency across management areas, and implementation of area and seasonal closures coordinated between state and federal waters.		

Louisiana: Louisiana participates in the GMFMC process and manages the shrimp fishery in state waters consistent with the GMFMC Shrimp FMP and federal regulations. Louisiana shrimp regulations include closed seasons, closure areas, and gear restrictions and requirements. **Other Gulf States:** All other Gulf states similarly participate in GMFMC and regulations across all U.S. Gulf states are compatible with federal regulations. **International:** There is a shrimp fishery prosecuted in Mexican waters of the Gulf of Mexico which harvests the same species (*Farfantepenaeus aztecus* and *Litopenaeus setiferus*) as the U.S. shrimp fishery. While no formal organization exists between the U.S. and Mexico on fisheries management, there is collaboration between the two countries and regulations in place in Mexico are compatible with U.S. regulations. Fishery management measures in Mexico for the shrimp fishery include the use of TEDs, closure areas, gear restrictions, and effort controls designed to maintain a minimum spawning biomass to ensure long term stability and use of the resource.[3]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] James Nance. Stock Assessment *Report 2008 Gulf of Mexico Shrimp Fishery*. NMFS SEFSC Galveston Lab. October 2008. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/BB%202009-10/D%20-%204%20Stock%20Assessment%20Report%20GOM%20Shrimp%20Fishery.pdf

[3] FAO, Global Study of Shrimp Fisheries, Fisheries Technical Paper No. 475. 2008. ftp://ftp.fao.org/docrep/fao/011/i0300e/i0300e02b.pdf

7.3.3 Have long-term management objectives been translated into a plan or other management document (subscribed to by all interested parties)?

(i) - Is there a plan? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
Federal: The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA, which is the primary law governing fisheries management in the U.S. The MSA requires that all species managed by the Councils be included in a FMP. The GMFMC manages the three penaeid shrimp species (brown, white, and pink) and royal red shrimp under the Gulf of Mexico Shrimp FMP. The Shrimp FMP was initially implemented in 1981 and has been amended several times as new information and scientific evidence has led to changes in management measures.[1] The goals and objectives of the Shrimp FMP are:		

- Optimize the yield from shrimp recruited to the fishery
- Encourage habitat protection measures to prevent undue loss of shrimp habitat
- Coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible.
- Promote consistency with the ESA and the MMPA
- Minimize the incidental capture of finfish by shrimpers, when appropriate
- Minimize conflicts between shrimp and stone crab fishermen
- Minimize adverse effects of underwater obstructions to shrimp trawling
- Provide for statistical reporting system

All five states participate in the GMFMC process and contributed to the development and amendments of the FMP. Each state maintains representatives on the GMFMC, the Shrimp SSC, and the shrimp AP. The FMP addresses compatibility between state and federal agencies in joint management of the shrimp fishery. Several measures in the initial FMP adopted by the GMFMC pertain to collaboration between states and federal management, including:

- Measure 1: establishment of a cooperative closure with Florida and federal agencies to protect small pink shrimp until they reach legal size.
- Measure 2: establishment of a cooperative closure of Texas territorial waters with Federal EEZ waters adjacent to Texas for the protection of small brown shrimp.
- Measure 5: The Gulf States are encouraged to adopt flexible management procedures which would provide regulation by administrative agencies of the shrimp resources in inland waters and territorial seas.
- Measure 6: The Gulf States are encouraged to adopt reciprocal internal management decisions flexible enough to allow joint management of shrimp with other states and federal agencies.

Louisiana:

LDWF participates in the GMFMC process, and manages the shrimp fishery in state waters consistent with federal regulations and recommendations.

There is also an FMP for management of the shrimp fishery within Louisiana waters. LDWF recently developed a new FMP for the Louisiana shrimp fishery, which was implemented in May 2015 and updated in July 2015.[2]
The stated goal of the Louisiana Shrimp FMP is "to ensure long-term conservation and sustainable use of shrimp resources for the maximum environmental, social, and economic benefit to the State and her citizens and visitors." The following objectives have been identified to achieve this goal:

1. Enhance economic value of the shrimp resource by promoting more effective and efficient harvesting strategies and practices
2. Achieve a level of fishing capacity that provides for a sustainable harvest and allows for a profitable fishery

3. Minimize incidental harvest of finfish, crustaceans, and protected species 4. Promote the protection, restoration, and enhancement of habitat and environmental quality necessary for sustaining the shrimp resource 5. Reduce conflicts among and within user groups, including non-shrimping user groups and activities 6. Minimize adverse effects of underwater obstructions to shrimp trawling 7. Reduce to the maximum extent possible waste of the resource by discouraging operations that result in culling to increase size of retained harvest 8. Promote research, surveys, and outreach efforts that contribute to achieving management goals and objectives		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.3.3 (ii) - Is it subscribed to? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The shrimp FMP and amendments form the basis for the regulations that are promulgated through the Code of Federal Regulations (CFR) by NOAA Fisheries. The Code of Federal Regulations (CFR), Title 50, Part 622, Subpart C contains the regulations for the shrimp fishery of the Gulf of Mexico. These regulations reflect the recommendations made through the GMFMC process. Regulations promulgated through the CFR are required by law for all participants fishing in the U.S. EEZ and are enforced by NOAA Fisheries Law Enforcement and the USCG Living Marine Resources division. Each of the five Gulf states has a JEA with NOAA Fisheries through the Cooperative Enforcement Program which allows U.S. state conservation law enforcement officers to enforce federal laws and regulations pertaining to marine resources and endangered species.[4] Regulations made by GMFMC and NOAA Fisheries are respected by the individual states and state regulations for territorial waters are consistent with federal regulations.[5] **Louisiana:** Fishery laws established by the Louisiana legislature and regulations promulgated by LWFC and LDWF reflect the goals and objectives in the Louisiana Shrimp FMP and are also consistent with the goals of the GMFMC Shrimp FMP. LDWF enforcement agents enforce all state fisheries regulations as well as federal regulations through the JEA.		

[1] 50 C.F.R. § 622
http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015.
http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[4] "Cooperative Enforcement Programs" *NOAA Fisheries.* Web. Accessed November 2015.
http://www.nmfs.noaa.gov/ole/about/our_programs/cooperative.html

[5] "Shrimp Regulations" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed Nov. 2015.
http://www.wlf.louisiana.gov/fishing/shrimp-1

7.3.4 Have attempts been made to foster cooperation in all matters related to:
(i) - information gathering and exchange? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
The GMFMC consists of 17 voting members, including the Southeast Regional Administrator of NOAA Fisheries, the directors of the five Gulf state marine resource management agencies and eleven additional members who are nominated by the state governors and appointed by the Secretary of Commerce.[1] In addition, there are four nonvoting members representing the USCG, USFWS, Department of State, and GSMFC. GMFMC meets five times a year at various locations around the Gulf coast. Information is gathered from the five state agencies and NOAA Fisheries and information exchange occurs through regular meetings of the Council and committees and advisory panels. All information gathered by GMFMC is available through briefing books, reports and other GMFMC documents in the Resource Library posted online.[2] Through the management of NOAA Fisheries SEFSC and Galveston Laboratory, the GSS is a thorough, consistent data collection system which has provided the NOAA Fisheries Galveston Laboratory scientists with statistical information needed to conduct assessments of the commercial shrimp fishery (refer to 7.1.4(a) for more detail of the GSS).[3] NOAA SEFSC also produces the Economics of the Federal Gulf Shrimp Fishery Annual Report. This document discusses shrimp landings, revenue, permits, vessel, and economic status of the shrimp fishery. This report is based on data collected through surveys from permit holding harvesters from across the Gulf states.[4] NOAA Fisheries data are also gathered through the Galveston Lab Observer Program and the ELB program (refer to 7.1.7(a) for details on the ELB and observer programs).[5] GSMFC coordinates with the five Gulf states through several programs to foster cooperation and gather and exchange information. The Fisheries Economic Data Program collects economic data on recreational and commercial fisheries to		

monitor economic performance and assess economic impacts across all five Gulf states.[6] The FIN was developed in 1999 out of a recognized need for coordinated and comprehensive data collection throughout the region for both commercial and recreational fisheries. FIN is divided into two sections, ComFIN for commercial fisheries and RecFIN for recreational fisheries. FIN is a state-federal cooperative program combining the efforts of all five Gulf State marine resource agencies, the National Marine Fisheries Service (NMFS), the USFWS the National Park Service (NPS), GMFMC and GSMFC. Its purpose is the collection, management and dissemination of statistical data and information on fisheries throughout the region.[7,8] Trip Ticket Programs in each of the five Gulf states are coordinated through the FIN program. The SEAMAP was developed for the collection, management and dissemination of fishery-independent data throughout the region and is a partnership between state and federal agencies and university programs. Each year SEAMAP publishes environmental and biological atlases of Gulf of Mexico and SEAMAP data are made available to each of the state and federal agencies for use in various programs and stock assessments.[9, 10] At the state level, LDWF personnel regularly work with other state agencies, industry groups and research institutes (Louisiana STF, LDEQ, LDNR, Louisiana Sea Grant, and Louisiana State University's Coastal Fisheries Institute) as well as federal agencies (NOAA Fisheries, USFWS, and the U.S. Geological Survey). LDWF representatives attend GMFMC and GSMFC meetings and assist in the data collection efforts detailed above.		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[3] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[4] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[7] "Fisheries Information Network (FIN)" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/fin.php

[8] FIN. *2014 Operations Plan for the Fisheries Information Network in the Southeastern United States*. GSMFC Number 218. June 2013. http://www.gsmfc.org/publications/GSMFC%20Number%20218.pdf

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[10] SEAMAP Subcommittee. *Annual Report to the Technical Coordinating Committee Gulf States Marine Fisheries Commission. October 1, 2012 to September 30, 2013*. GSMFC No. 221. October 2013. http://www.gsmfc.org/publications/GSMFC%20Number%20221.pdf

7.3.4 (ii) - fisheries research? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Fisheries research for the Gulf of Mexico shrimp stocks is conducted by NOAA Fisheries, with additional research on inshore waters by each of the individual state agencies. This research is shared regionally through the GMFMC and GSMFC processes.[1,2] Through the management of NOAA Fisheries SEFSC and Galveston Laboratory, the GSS is a thorough, consistent data collection system which has provided the NOAA Fisheries Galveston Laboratory scientists with statistical information needed to conduct assessments of the commercial shrimp fishery (refer to 7.1.4(a) for details on the GSS).[3] NOAA SEFSC also produces the Economics of the Federal Gulf Shrimp Fishery Annual Report. This document discusses shrimp landings, revenue, permits, vessel, and economic status of the shrimp fishery. This report is based on data collected through surveys from permit holding harvesters from across the Gulf states. Information gathered from this survey helps determine economic trends of the industry and helps understand the social and economic impacts regulation changes may have on the fishery and communities.[4] NOAA Fisheries data are also gathered through the Galveston Lab Observer Program and the ELB program (refer to 7.1.7(a) for details on the ELB and observer programs).[5] The GMFMC maintains a SSC to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[6] In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC. Each SSC includes a representative from each of the five Gulf state agencies. Further collaboration on fisheries research occurs through the GSMFC. GSMFC coordinates with the five Gulf states through several programs to foster cooperation in research. The Fisheries Economic Data Program collects economic data on recreational and commercial fisheries to monitor economic performance and assess economic impacts across all five Gulf states.[7] The IJF Program coordinates management efforts between the five states through the development of regional FMPs for fisheries not covered by a GMFMC FMP.[8] The SEAMAP was developed for the collection, management and dissemination of fishery-independent data throughout the region and is a partnership between state and federal agencies and university programs.[9]		

At the state level, LDWF personnel regularly work with other state agencies, industry groups and research institutes (Louisiana STF, LDEQ, LDNR, Louisiana Sea Grant, and Louisiana State University Coastal Fisheries Institute) as well as federal agencies (NOAA Fisheries, USFWS, and the U.S. Geological Survey). LDWF representatives attend GMFMC and GSMFC meetings and assist in the data collection and research efforts detailed above.		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[3] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[4] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[7] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[8] "Interjurisdictional Fisheries Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/ijf.php

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

7.3.4 (iii) - fisheries management? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
GMFMC promotes cooperation in management between the five states and federal agencies. The GMFMC consists of 17 voting members, including the Southeast Regional Administrator of NOAA Fisheries, the directors of the five Gulf state marine resource management agencies and eleven additional members who are nominated by the state governors and appointed by the Secretary of Commerce.[1] In addition, there are four non-voting members representing the USCG, USFWS, Department of State, and the GSMFC. GMFMC meets five times a year at various locations around the Gulf coast. GMFMC also maintains a specific Shrimp Management Committee including management representatives from the state agencies, NOAA Fisheries, and GSMFC; a Shrimp AP composed of shrimp industry representatives from across the Gulf and a Shrimp SSC made up on biologists from each of the state agencies.[2,3] These processes ensure continued communication and collaboration between state and federal agencies and industry		

participants on fishery management for the Gulf shrimp fishery. Furthermore, the GMFMC Shrimp FMP goals and objectives include "coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible."[3] Measures considered and adopted in the original FMP to carry out this goal include: - Measure 1: establishment of a cooperative closure with Florida and federal agencies to protect small pink shrimp until they reach legal size. - Measure 2: establishment of a cooperative closure of Texas territorial waters with Federal EEZ waters adjacent to Texas for the protection of small brown shrimp. - Measure 5: The Gulf states are encouraged to adopt flexible management procedures which would provide regulation by administrative agencies of the shrimp resources in inland waters and territorial seas. - Measure 6: The Gulf States are encouraged to adopt reciprocal internal management decisions flexible enough to allow joint management of shrimp with other states and federal agencies. Additionally, GSMFC coordinates with the five Gulf states through several programs to foster cooperation in fisheries management. (For information on GSMFC programs including the Fisheries Economic Data Program, IJF, and SEAMAP, see responses to 7.3.4 (i) and (ii)).		

[1] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[2] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[3] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

7.3.4 (iv) - fisheries development? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
The FAO definition of development is "continued progress towards desirable results, rather than growth."[1] The five Gulf states and NOAA Fisheries continue to collaborate on fisheries development through GMFMC.[2] Through the development of regional assessments and the Shrimp FMP, new research is continually shared, additional research and management recommendations are identified, and implementation is encouraged. Some recent developments include improved technology and data collection through the cELB program, continued improvement and certification of new BRDs through the Harvesting Systems Unit.[3,4] Additionally, collaboration through GSMFC has led to the development and implementation of the Trip Ticket Programs allowing for uniform data collection and reporting throughout the five Gulf states, and enhanced seafood marketing through the Gulf States Marketing Coalition initiative.[5,6]		

[1] "FAO Term Portal- Fisheries" *United Nations Food and Agricultural Organization*. Web. Accessed November 2015. http://www.fao.org/fi/glossary/

[2] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[3] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[4] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[5] "Fisheries Information Network (FIN)" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/fin.php

[6] "Oil Disaster Recovery Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/odrp.php

7.4 Data gathering and management advice

7.4.2 Has relevant research been carried out on:

(i) - the resource? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries is responsible for assessing and managing Gulf shrimp fisheries. NOAA SEFSC is the branch responsible for providing multi-disciplinary research to support management decisions of the GMFMC and NOAA Fisheries.[1] SEFSC maintains labs in Galveston, TX; Lafayette, LA; Panama City, FL; Pascagoula, MS and Stennis, MS. SEFSC Research and Data programs are responsible for biological, economic and socio-cultural research and data collection for commercial and recreational fisheries, economics and fisheries-independent data. SEFSC conducts stock assessments for all species managed by GMFMC; stock assessments for shrimp are conducted annually through the Galveston Lab Shrimp Fishery Research Program.[2] To perform these stock assessments, NOAA Fisheries utilizes data from port agents, state trip ticket programs, electronic logbook data and observer programs. The SEFSC collects fishery-dependent data for the shrimp fishery through the GSS. The GSS utilizes port agents throughout the Gulf of Mexico to collect landings data (amount and value) from seafood dealers, and interview data (fishing effort and location) from fishermen (refer to 7.1.4(a) for details on the GSS).[3] Additionally, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data.[4] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program (refer to 7.1.7 (a) for further details on ELB and observer programs). NOAA Fishery-Independent resource surveys are conducted through the SEFSC Mississippi Labs. Shrimp/Bottomfish surveys are conducted each Fall and Summer,		

which are designed to provide a time-series for monitoring trends in resource abundance.[5]

Gulf States:
GSMFC also plays a role in the Gulf shrimp fishery's assessment process. GSMFC organizes state supplied data to create regional reports. Once approved by the Commission, GSMFC publishes reports in the publications area of their website.[6] GSMFC assessment programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[7,8] SEAMAP Gulf of Mexico survey objectives include (but are not limited to):[9]

- Monitoring penaeid shrimp size and distribution
- Evaluating the "Texas Closure" portion of GMFMC's FMP
- Providing data on shrimp and groundfish stocks
- Obtaining measurements to determine population size structures

The Fisheries Economic Data Program published peer-reviewed economic reports in 2014.[10,11] These reports assessed the economic landscape of the shrimp industry, providing revenue, operating cost, annual expenditure, employment, and harvesting/harvester data.

Louisiana:
As noted in the Louisiana Shrimp FMP, shrimp stocks in the Gulf of Mexico are continuous across state and federal boundaries and, therefore, are assessed at the regional level through NOAA Fisheries. LDWF does monitor shrimp resources in state waters to inform state level management decisions, and contributes data to the regional assessments conducted annually by the Galveston Lab. LDWF maintains databases for fishery-dependent and fishery-independent data and the conducts additional studies as needed.[12] For further details on the fishery-independent monitoring program and the trip ticket program, refer to 7.1.7(a).

[1] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[2] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] 2010 Analysis of Gulf Shrimp Moratorium Permits, NOAA.

[5] "Surveys" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[6] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[7] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[8] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[10] Miller, Alexander, Maryam Tabarestani, and Jack Isaacs. 2014. *A Survey of Recreational Shrimpers in the Northern U.S. Gulf of Mexico*. Gulf States Marine Fisheries Commission Publication, Publication Number 228. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20228.pdf

[11] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[12] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.4.2 (ii) - climatic and environmental factors? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries conducts research on climate change and fisheries.[1,2] In March 2015, NOAA Fisheries released a draft Climate Science Strategy (NCSS) for public comment. This strategy is designed to collect and provide information on changing climate and ocean conditions to better prepare for and respond to climate-related impacts.[3] The NCSS includes the following objectives: - Objective 1: Identify appropriate, climate-informed reference points for managing living marine resources (LMRs). - Objective 2: Identify robust strategies for managing LMRs under changing climate conditions. - Objective 3: Design adaptive decision processes that can incorporate and respond to changing climate conditions. - Objective 4: Identify future states of marine and coastal ecosystems, LMRs, and LMR-dependent human communities in a changing climate. - Objective 5: Identify the mechanisms of climate impacts on LMRs, ecosystems, and LMR-dependent human communities. - Objective 6: Track trends in ecosystems, LMRs and LMR-dependent human communities and provide early warning of change. - Objective 7: Build and maintain the science infrastructure needed to fulfill NOAA Fisheries mandates with changing climate conditions. For each of the objectives listed, there are specific actions identified to help achieve that objective within the strategy. The NCSS also includes a set of priority recommendations.		

NOAA conducts monitoring, research, modeling and assessment activities to inform fisheries management and protected resources in a changing environment. The Fish Stock Climate Vulnerability Assessment is currently being used to identify which stock may be most vulnerable to climate change, identifying areas where more data are needed, and providing a basis for actions that can be taken to reduce impacts.[4] NOAA Fisheries Climate website provides a series of tools currently available regarding climate resilience including OCEANADAPT, which is a web-based tool developed through a partnership between NOAA Fisheries and Rutgers University that provides information about the distribution of commercially and recreationally important marine species over time.[5,6] The SEFSC published the Ecosystem Status Report for the Gulf of Mexico in December 2013. This report includes information on climate drivers and physical pressures on the Gulf of Mexico ecosystem as well as fishing indicators.[7] **Louisiana:** The LDWF fishery independent monitoring program includes collection of environmental parameters such as temperature, salinity and dissolved oxygen for each sample taken.[8,9] These data are utilized during analyses of resource trends to identify environmental influences on resource abundance. The Louisiana Shrimp FMP contains a section on Environmental Factors and discusses various environmental influences on the shrimp fishery.[10] Salinity, water temperature, and dissolved oxygen are each known to affect the distribution, abundance, growth, and survival of penaeid shrimp species. The hydrological conditions in shrimp nursery areas play a major role in shrimp abundance and LDWF monitors these conditions closely, along with shrimp abundance, growth, and distribution to develop appropriate management recommendations. The LSU Department of Oceanography and Coastal Sciences also conducts extensive research on fisheries and the coastal environment of Louisiana with the goal of understanding habitat and ecosystem structure and function and provides valuable research for resource management.[11]		

[1] "Climate, Fisheries, and Protected Resources" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/stories/2014/03/climate_portal.html

[2] NOAA Fisheries. *Fish Stock Climate Vulnerability Assessment*. http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/Fish_Stock_Climate_Vulnerability_Assessment.pdf

[3] NOAA Fisheries. *Draft Climate Science Strategy*. January 2015. http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/draft_NOAA%20Fisheries_Climate_Science%20Strategy_Jan_2015.pdf

[4] "Assessing the Vulnerability of Fish Stocks in a Changing Climate" *NOAA Fisheries*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/ecosystems/climate/activities/assessing-vulnerability-of-fish-stocks

[5] "Climate Tools" *NOAA Office of Science and Technology.* Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/ecosystems/climate/tools/index

[6] *Ocean Adapt*. Web. Accessed November 2015. http://oceanadapt.rutgers.edu/

[7] Mandy Karnauskas, Michael J. Schirripa, Christopher R. Kelble, Geoffrey S. Cook and J. Kevin Craig. Ecosystem Status Report for the Gulf of Mexico. NOAA Technical Memorandum NMFS-SEFSC-653. December 2013. http://gulfcouncil.org/docs/Gulf%20of%20Mexico%20Ecosystem%20Status%20Report.pdf

[8] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[9] LDWF. "Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs. June 2015"

[10] Bourgeois et al., 2015. p. 50.

[11] "Fisheries Science" *Louisiana State University*. Web. Accessed November 2015. http://www.oceanography.lsu.edu/index.php/research/fisheries-science/

7.4.2 (iii) - the socio-economic context? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA SEFSC conducts an Annual Economic Survey of Federal Gulf Shrimp Permit Holders each spring collecting data on operating expenses and costs associated with owning and maintaining shrimp vessels.[1] Each year a third of the permit holders are randomly selected for this survey and information is used to assess trends in the financial state of the fishery, social and economic effects of regulations, and other economic factors impacting the Gulf shrimp fishery. NOAA SEFSC also contains a Social Science Research Group (SSRG) that conducts applied research on socio-cultural aspects of marine resources in the Gulf of Mexico.[2] This research largely focuses on participant and community dependence and engagement in fisheries and is directed by the principles of the MSA National Standard 8:[3] - *Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.* In 2005, NOAA conducted a series of studies to identify communities associated with the fishing industry and produced a report of the significant fishing communities in Louisiana.[4,5,6]		

The GMFMC Shrimp FMP contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a RIR.[7] **Gulf States:** GSMFC Fisheries Economic Data Program has conducted similar analyses to the SEFSC Annual Economic Survey for the inshore (non-federally-permitted) fleet in 2008 and 2012.[8,9,10] Additionally, GSMFC has produced reports on the economic baseline and characterization of dockside seafood dealers, and seafood processors for the U.S. Gulf of Mexico.[11,12] **Louisiana:** LDWF Socioeconomic Research and Development Section conducts research on the socioeconomics of important Louisiana and Gulf of Mexico fisheries to support resource management decisions. The Socioeconomic Research and Development Section utilizes data gathered through the trip ticket program and specialized surveys to evaluate the economic status of fisheries and the impacts of different regulatory actions. This research is published in LDWF FMPs, department reports and peer-reviewed scientific journals and is presented at scientific conferences and management meetings. The Louisiana Shrimp FMP contains the most recent socioeconomic research on the Louisiana shrimp fishery.[13] LDWF solicits participation from the entire fishing community and is required by law at both the state and federal level to allow public participation. LWFC meetings are held monthly and follow the open meetings law; therefore, information is publically posted via the LDWF website and a public comment period is scheduled during each meeting.[14,15] LDWF maintains the Louisiana STF, which is made up of members of the shrimp industry who provide feedback to LDWF and LWFC on various aspects of the shrimp industry.[16] LDWF may also conduct industry scoping meetings during initial development of new regulations or to address specific issues with the fishing community.		

[1] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[2] "Social Science Research Group" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[3] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[4] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume I: Acension Parish through LaFayette Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/ascension_lafayette.pdf

[5] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume II: Lafourche Parish through St. Landry Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/lafourche_stlandry.pdf

[6] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume III: St. Martin Parish through Vermillion Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/stmartin_vermilion.pdf

[7] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[8] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[9] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[10] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[11] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[12] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[13] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 16-39. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[14] La. R.S. 42:12-28 (Open Meetings Law) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[15] "Commission agendas" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commissionagenda1

[16] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

7.4.3 Has research been carried out on:

(i) - cost-benefits of fishing? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA SEFSC conducts an Annual Economic Survey of Federal Gulf Shrimp Permit Holders each spring collecting data on operating expenses and costs associated with owning and maintaining shrimp vessels.[1] Each year a third of the permit holders are randomly selected for this survey and information is used to		

assess trends in the financial state of the fishery, social and economic effects of regulations, and other economic factors impacting the Gulf shrimp fishery. **Louisiana:** LDWF Socioeconomic Research and Development Section conducts research on the socioeconomics of important Louisiana and Gulf of Mexico fisheries to support resource management decisions. The Socioeconomic Research and Development Section utilizes data gathered through the trip ticket program and specialized surveys to evaluate the economic status of fisheries and the impacts of different regulatory actions. This research is published in LDWF FMPs, department reports and peer-reviewed scientific journals and is presented at scientific conferences and management meetings. The Louisiana Shrimp FMP contains the most recent socioeconomic research on the Louisiana shrimp fishery.[2]		

[1] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 16-39. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.4.3 (ii) - alternative management strategies? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Alternative management strategies are explicitly and transparently considered throughout the management process through GMFMC. Each FMP contains a series of alternatives for each management measure, a rationale for the measure adopted and a list of which alternatives were considered but not adopted.[1] Additionally, all GMFMC meetings, including meetings of the Shrimp Management Committee, Shrimp SSC, Shrimp Advisory Panel, contain discussions of alternative management strategies, which are documented in meeting minutes and are open to the public.[2] **Louisiana:** LDWF considers the management regulations utilized by different states throughout the Gulf of Mexico when setting shrimp fishery regulations. Management options are discussed between state and federal agencies through the GSMFC meetings and the GMFMC council, committee, and advisory panel meetings, in which LDWF representatives participate. In Louisiana, alternative management options are discussed and documented (as meeting minutes) during STF meetings and LWFC meetings.[3,4] The Louisiana Shrimp FMP includes a section on 'Current Issues and Management Options', which provides a series of options for management consideration regarding issues that LDWF has identified within the fishery.[5]		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] "Council Meeting Briefing Books" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/council_meeting_briefing_books.php

[3] "Shrimp Task Force Meetings" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/meetings

[4] "Commission Meeting Minutes" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commission-meeting-minutes

[5] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 65-71. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.4.4 Are timely and reliable statistics available on catch and fishing effort maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[1] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. All data are entered into the Fishery Information System (FIS) Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies.[2] NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Additional information for shrimp is gathered through the GSS, which utilizes data collection by port agents stationed throughout the Gulf of Mexico (refer to 7.1.4(a) for details on GSS).[3] Weekly reports are posted on the NOAA Fisheries Statistics website documenting Gulf shrimp landings by area and species and ex-vessel price and landings. A monthly Gulf Coast Shrimp Statistics report is also posted.[4] Federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data. Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program (refer to 7.1.7(a) for details).[5] 50 CFR 622.51 requires the reporting activities for both harvesters and dealers in the Gulf of Mexico shrimp fishery (refer to 7.1.7(a) for details.)[6] GSMFC data collection programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[7,8] SEAMAP Gulf of Mexico Resource Surveys assess the shrimp fishery through the		

Summer and Fall Shrimp/Groundfish Surveys. The Fisheries Economic Data Program published peer-reviewed economic reports in 2014. These reports assessed the economic landscape of the shrimp industry, providing revenue, operating cost, annual expenditure, employment, and harvesting/harvester data. **Louisiana:** LDWF meets international standards of data collection through a series of programs including the Trip Ticket Program, the Fishery Independent Monitoring Program, and collaborations with other agencies (see 7.1.7(a) for further details).[9,10] These programs gather the necessary information on total catch, gear and fishing methods, vessel information, and effort data, as well as biological information of the species including age, growth, recruitment, distribution, abundance and environmental factors. The LDWF Socioeconomic Research and Development Section also conducts research on important fisheries to support management decisions. Fishery descriptions are included in LDWF FMPs including statistics on catch, effort, value, gear types, market conditions, communities, and user group conflicts.[11]		

[1] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[2] "Fisheries Monitoring Branch" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/data/monitoring.htm

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[5] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[6] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[7] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[8] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[9] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

[10] LDWF. "Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs. June 2015"

[11] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 16-36. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.4.5 Has sufficient knowledge of social, economic and institutional factors relevant to the fishery in question been developed through data gathering, analysis and research?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA SEFSC contains a SSRG that conducts applied socioeconomic and cultural research on marine resources in the Gulf of Mexico.[1] This research largely focuses on participant and community dependence and engagement in fisheries and is directed by the principles of the MSA National Standard 8.[2] Within the SSRG is a Southeast Shrimp Fisheries research group focuses on data collection and analysis of economic information specific to the shrimp industry. This group conducts the Annual Economic Survey of Federal Gulf Permit Holders each spring. This survey collects information on operating costs, and expenses associated with owning and maintaining shrimp vessels. This information is used to assess trends in the economic state of the Gulf shrimp fishery and determine the impacts of regulation changes and other management actions.[3,4] In 2005, NOAA conducted a series of studies to identify communities associated with the fishing industry and produced a report of the significant fishing communities in Louisiana.[5,6,7] NOAA's Office of Science and Technology has developed social indicators of fishing community vulnerability and resilience, and maintains community profiles of fishing communities throughout the U.S.[8,9] NOAA SERO also maintains community snapshots on its website of fishing communities throughout the Gulf and includes information on the dominant fisheries, fleet characteristics and demographics of each community.[10] The GMFMC Shrimp FMP also contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a RIR.[11] **Gulf States:** GSMFC Fisheries Economic Data Program has conducted analyses (similar to the SEFSC Annual Economic Survey) for the inshore (non-federally-permitted) fleet in 2008 and 2012.[12,13,14] Additionally, GSMFC has produced reports on the economic baseline and characterization of dockside seafood dealers, and seafood processors for the U.S. Gulf of Mexico.[15,16] **Louisiana:** LDWF Socioeconomic Research and Development Section conducts research on the socioeconomics of important Louisiana and Gulf of Mexico fisheries to support resource management decisions.[17] The Socioeconomic Research and Development Section utilizes data gathered through the trip ticket program and specialized surveys to evaluate the economic status of fisheries and the impacts of different regulatory actions. This research is published in LDWF FMPs, department reports		

and peer-reviewed scientific journals and is presented at scientific conferences and management meetings. The Louisiana Shrimp FMP contains the most recent socioeconomic research on the Louisiana shrimp fishery.[18] LDWF solicits participation from the entire fishing community and is required by law at both the state and federal level to allow public participation. LWFC meetings are held monthly and follow the Open Meetings Law; therefore, information is publically posted via the LDWF website and a public comment period is scheduled during each meeting.[19,20] LDWF maintains the Louisiana STF, which is made up of members of the shrimp industry who provide feedback to LDWF and LWFC on various aspects of the shrimp industry.[21] LDWF may also conduct industry scoping meetings during initial development of new regulations or to address specific issues with the fishing community.		

[1] "Social Science Research Group" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[2] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[3] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[4] NMFS SEFSC. *2011 Economics of the Federal Gulf Shrimp Fishery Annual Report*. NOAA Southeast Fisheries Science Center. December 2013. http://www.sefsc.noaa.gov/docs/2011_Gulf_shrimp_econ_report.pdf

[5] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume I: Acension Parish through LaFayette Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/ascension_lafayette.pdf

[6] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume II: Lafourche Parish through St. Landry Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/lafourche_stlandry.pdf

[7] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume III: St. Martin Parish through Vermillion Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/stmartin_vermilion.pdf

[8] "About Social Indicators" *NOAA Office of Science and Technology*. Web. Accessed November 2015. https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index

[9] Jepson and Colburn, 2013. "Development of Social Indicators of Fishing Community Vulnerability and Resilience in the U.S. Southeast and Northeast Regions." NOAA OST http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/S3_Fishing_Com_Vulnerability_Resilience.pdf

[10] "Snapshots of Human Communities and Fisheries in the Gulf of Mexico and South Atlantic" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/

[11] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[12] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[13] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[14] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[15] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[16] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[17] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

[18] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 16-39. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[19] La. R.S. 42:12-28 (Open Meetings Law) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[20] "Commission agendas" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commissionagenda1

[21] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

7.4.6 Are fishery-related and other supporting scientific data relating to fish stocks covered by subregional or regional fisheries management organizations or arrangements compiled in an agreed format and provided in a timely manner to the organization or arrangement?

(i) - in an agreed format? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
GMFMC: The GMFMC utilizes data collected through NOAA Fisheries and each of the five Gulf state management agencies. GMFMC maintains a standing Data Collection Committee, which "reviews and advises the Council on the data requirements for		

managing each fishery, the statistical methodology needed, and on all issues related to data and data collection."[1]

The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[2] Landings data are collected by the SEFSC Fisheries Statistics Division from each individual state agency Trip Ticket Reporting Program. Data collection methods are coordinated through the GSMFC FIN to ensure that standardized data are collected, where feasible. All data are entered into the Fishery Information System (FIS) Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers on standardized trip ticket forms. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico (refer to 7.1.4(a) for further detail on the GSS).[3] Trip ticket data from each of the states are verified against port agent sampling data and integrated into the GSS. Weekly reports are posted on the NOAA Fisheries Statistics website documenting Gulf shrimp landings by area and species, and ex-vessel price and landings. A monthly Gulf Coast Shrimp Statistics report is also posted.[4] All federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. Two separate databases are maintained for port agent and dealer reported data and fishermen reported data.[5] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program.[6,7] The new cELB program, which began in 2014, transmits the most recent data from vessels directly to the Galveston Lab whenever the vessel is within cellular range. Data collection by observers is carried out in a standard format defined in an observer manual.

<u>GSMFC</u>:
Fishery-related and other supporting scientific data are gathered individually by each state's management agency and submitted and reviewed regularly by GSMFC. The GSMFC meets twice a year (March and October) to review scientific data and regional management activities. Data on fishery trends in landings, values, and other activities of the fishery are presented by each state and reviewed at each meeting. The GSMFC IJF program also collects data regularly for regional assessments and FMP updates of stocks not covered by federal FMPs; data are submitted by the states on request based on the needs of specific projects. GSMFC FMPs are reviewed every five years and updated at intervals determined by the TCC.[8]

GSMFC data collection programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[9,10] NOAA coordinates with SEAMAP through the SEFSC Mississippi Labs on annual fishery-independent surveys. Shrimp/Bottomfish surveys are conducted each Fall and Summer, which are designed to provide a time-series for monitoring trends in resource abundance. Data are made available to state and federal resource managers.[11]

[1] GMFMC, 2012. Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] "Commercial Fisheries Statistics" *NOAA Office of Science and Technology*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[5] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[6] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[7] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[8] VanderKooy, Steve. GSMFC. Personal Communication. August, 2014.

[9] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[10] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[11] "Mississippi Labs: Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

7.4.6 (ii) - in a timely manner? **Yes... [1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
GMFMC: The GMFMC utilizes data collected through NOAA Fisheries and each of the five Gulf state management agencies. GMFMC maintains a standing Data Collection Committee, which "reviews and advises the Council on the data requirements for managing each fishery, the statistical methodology needed, and on all issues related to data and data collection."[1] The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[2] All data are entered into the Fishery Information System (FIS) Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Data are submitted by dealers on a monthly basis. Additional information for shrimp is gathered through the GSS, which includes data collection		

by port agents stationed throughout the Gulf of Mexico.[3] Weekly reports are posted on the NOAA Fisheries Statistics website documenting Gulf shrimp landings by area and species and ex-vessel price and landings. A monthly Gulf Coast Shrimp Statistics report is also posted.[4] All federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal.[5] Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program.[6,7] The new cELB program, which began in 2014, transmits the most recent data from vessels directly to the Galveston Lab whenever the vessel is within cellular range. Observer coverage is compiled into annual reports made available to federal and state fisheries managers and posted publically on NOAAs website. GSMFC: Fishery-related and other supporting scientific data are gathered individually by each state's management agency and reviewed regularly by GSMFC. The GSMFC meets twice a year (March and October) to review scientific data and regional management activities. Data on fishery trends in landings, values, and other activities of the fishery are presented by each state and reviewed at each meeting. GSMFC data collection programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[8,9] SEAMAP Shrimp/Bottomfish surveys are conducted each fall and summer.[10] SEAMAP data are entered into the Fisheries Scientific Computer System (FSCS) and made available to state and federal managers.		

[1] GMFMC, 2012. *Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] "Commercial Fisheries Statistics" *NOAA Office of Science and Technology*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[5] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[6] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[7] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[8] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[9] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[10] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

7.4.7 With respect to the data collected for management purposes, are applicable confidentiality requirements complied with? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
GMFMC maintains confidentiality of statistics in compliance with 50 C.F.R. 600.130, 600.405, 600.425, and NOAA Administrative Order (NAO) 216-100. The GMFMC may establish policies and procedures applicable to it, its committees, and advisory groups to ensure confidentiality of statistics submitted to GMFMC by federal or state authorities, and private persons. In regards to statistics submitted by a state or federal entity, policies and procedures must be consistent with the laws and regulations of the federal or state entity submitting the statistics.[1] 50 CFR 600.130 requires each regional council to establish procedures for ensuring confidentiality, 50 CFR 600.405 defines the types of statistical information that NOAA is authorized to collect and requires to ensure confidentiality of, and 50 CFR 600.425 pertains to circumstances allowing release or refusal of requested information in compliance with other confidentiality requirements.[2,3,4] NAO 216-100 "prescribes policies and procedures for protecting the confidentiality of data submitted to and collected by the National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS) as authorized or required by law; informs authorized users of their obligations for maintaining the confidentiality of data received by NMFS; provides for operational safeguards to maintain the security of data; and states the penalties provided by law for disclosure of confidential data."[5] <u>GSMFC</u>: GSMFC follows NAO 216-100 "Protection of Confidential Fisheries Statistics"[5] and adheres to the "Fisheries Rule of Three," which prevents disclosure of proprietary or confidential commercial of financial information regarding fishing and fish processing operations thus preventing the distribution of any fisheries data that would identify a single fisheries entity. GSMFC employees and representatives must sign non-disclosure agreements prior to handling confidential statistics, which includes approval from NMFS. Penalties for unauthorized distribution of confidential fisheries data include both civil and criminal actions and are set out in Federal Statutes- U.S.C. 552 and U.S.C 1905.[6,7] LDWF must abide by strict confidentially requirements set forth by Louisiana law when gathering fishery dependent data; summaries of non-confidential data are disseminated to the public and other agencies.[8] Data collected through the Trip Ticket Program is protected under Louisiana Administrative Code 76:I.321.[9]		

[1] GMFMC, 2012. *Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures.* http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] 50 C.F.R. § 600.130 http://www.gpo.gov/fdsys/pkg/CFR-2010-title50-vol8/pdf/CFR-2010-title50-vol8-sec600-130.pdf

[3] 50 C.F.R. § 600.405 https://www.law.cornell.edu/cfr/text/50/600.405

[4] 50 C.F.R. § 600.425 https://www.law.cornell.edu/cfr/text/50/600.425

[5] NOA 216-100 https://www.st.nmfs.noaa.gov/st1/recreational/documents/Intercept_Appendices/Appendix%20M%20031408%20NOAA%20administrative%20order%20216-100.pdf

[6] U.S.C. § 552 http://www.justice.gov/oip/blog/foia-update-freedom-information-act-5-usc-sect-552-amended-public-law-no-104-231-110-stat

[7] 18 U.S.C § 1905 http://www.law.cornell.edu/uscode/text/18/1905

[8] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 142. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[9] La. Admin. Code 76 http://www.doa.la.gov/Pages/osr/lac/books.aspx

7.5 Precautionary approach

7.5.1 (a) Has the precautionary approach been applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment?[1] **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
Federal: The Gulf of Mexico shrimp fishery is managed by NOAA Fisheries and GMFMC under the requirements of the MSA. The ten National Standards of the MSA provide a robust and precautionary approach to fisheries management. The ten national standards are as follows:[2] 1. Achieve OY and prevent overfishing 2. Based on best available scientific evidence 3. Manage stocks as a unit 4. Allocations should be fair and equitable, promote conservation, and prevent excessive shares 5. Consider efficiency in utilization; not have economic allocation as sole purpose 6. Allow for variations and contingencies 7. Minimize costs and avoid duplication 8. Consider fishing communities to provide for their sustained participation and to minimize adverse economic impacts 9. Minimize bycatch and bycatch mortality 10. Promote safety of human life at sea		

NOAA Fisheries has developed a set of guidelines for each National Standard (NS) and all FMPs, amendments and regulations must comply with the NS Guidelines. These guidelines explicitly require the consideration of uncertainties in setting conservation and management measures, and mandate the determination of biological reference points and harvest control rules to ensure that overfishing is prevented, overfished stocks are rebuilt within reasonable timeframes, and bycatch is minimized. A NOAA Technical Memorandum was published providing guidance on the use of precautionary approaches when implementing NS1.[3] The GMFMC Shrimp FMP and amendments comply with all aspects of the National Standards.[4]

Limit and target reference points have been established for the fishery. Currently, The target OY for each stock is MSY. Amendment 13 of the Shrimp FMP determined that there is no biological reason to set OY below MSY because penaeid shrimp are annual stocks whose abundance in a given year is dictated primarily by environmental conditions.[5]

Recent changes have been made to the model used in stock assessments for penaeid shrimp in the Gulf of Mexico to improve assessments. Previously, a VPA model was used in Gulf shrimp stock assessments; however, recently the SSC approved a new Stock Synthesis model as the best scientific model available for these species. Due to the changes in the model outputs, the GMFMC has changed to the SDC for penaeid shrimp species to fit with the new assessment model outputs in Amendment 15 of the GMFMC Shrimp FMP.

The new reference points are:[6]

MSY

- Brown shrimp: MSY is 146,923,100 lbs. of tails
- White shrimp: MSY is 89,436,907 lbs. of tails

Overfishing

The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the fishing mortality rate at MSY (F_{MSY}).

- Brown shrimp: 9.12
- White shrimp: 3.48

Overfished

The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum spawning stock biomass at MSY (SSB_{MSY}).

- Brown shrimp: SSBMSY is 6,098,824 lbs. of tails
- White shrimp: SSBMSY is 365,715,146 lbs. of tails

These values will be updated every 5 years through the framework procedure, unless changed earlier by the GMFMC.

Penaeid shrimp in the Gulf of Mexico are exempt from requirements for ACLs and Accountability measures (AMs) because they have a life cycle of approximately one year. MSA Section 600.310(h)(2) states:[7]

(2) Exceptions from ACL and AM requirements—(i) Life cycle. Section 303(a)(15) of the Magnuson-Stevens Act" shall not apply to a fishery for species that has a life cycle of

approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species" (as described in Magnuson-Stevens Act section 303 note). This exception applies to a stock for which the average length of time it takes for an individual to produce a reproductively active offspring is approximately 1 year and that the individual has only one breeding season in its lifetime. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule. Annual stock assessments are conducted for the penaeid shrimp species in the Gulf. If MFMT is exceeded for two consecutive years, the appropriate committees and/or panels (e.g. stock assessment panels, advisory panels, SSCs) would convene to review changes in apparent stock size, changes in fishing effort, potential alterations in habitat or other environmental conditions, fishing mortality and other factors that may have contributed to the decline. Brown shrimp and white shrimp stocks have been monitored by NOAA Fisheries since 1970, and have remained above the minimum thresholds; therefore, have never been determine overfished or overfishing. Recent assessments of the fishery have determined that the current fleet capacity does not have the ability to overfish stocks.[8] Management of the fishery is largely focused on improving economic conditions and reducing bycatch mortality. Management measures in effect include closed areas for the protection of habitat and small shrimp (which protects against growth overfishing), effort limitations, and required use of BRDs and TEDs to minimize bycatch. The Precautionary Approach is also mandated in the Guidelines to National Standard 9, with regard to minimizing bycatch and bycatch mortality.[9] The Shrimp FMP set the following objective: "promote consistency with the ESA and MMPA." The shrimp fishery has been evaluated in relation to the ESA and MMPA and is consistent with the requirements established to protect species managed under these acts. ESA: Section 7(a)(2) of the ESA requires each federal agency to ensure that any action they authorize is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of any listed species. In 2014 and update Biological Opinion was done, under the Section 7(a)(2) requirements, for the continued implementation of sea turtle conservation measures applicable to shrimp trawling and the continued authorization of the Southeast shrimp fisheries.[10] The opinion provides information on interactions with any threatened or endangered species, states the amount of incidental of listed species that may occur, specifies reasonable or prudent measures that are required to minimize impacts, requires monitoring of effects, and recommends conservation measures to further conserve listed species. The biological opinion was based on the best available scientific data and considered uncertainties within the evaluation process. The 2014 biological opinion made recommendations for measures to minimize impacts of incidental take to sea turtles		

and smalltooth sawfish, and concluded that continued authorization of the Southeast shrimp fisheries in federal waters is not likely to jeopardize the continued existence of threatened or endangered species. MMPA: NOAA Office of Protected Species conducted a risk assessment of the shrimp fishery to determine potential impacts to marine mammals. The shrimp fishery was determined as a Category II fishery, indicating that the annual mortality or serious injury of a marine mammal stock is greater than 1% but less than 50 % of the stocks potential biological removal (PBR).[11] This requires fishery participants to register with the Office of Protected Species, report any incidences of serious injury or mortality of a marine mammal, and compliance with and take reductions plans that are established. This designation was based primarily on interactions with bottlenose dolphins and there is currently no take reduction plan for bottlenose dolphins in the Gulf of Mexico. **<u>Louisiana:</u>** There is currently no explicit definition of the precautionary approach at the state level of management. While no formal definition of precautionary approach has been implemented for management of the shrimp fishery in Louisiana, management has taken measures to ensure prudent foresight, reduce or avoid risk to the resource, the environment, and the people and does take into account existing uncertainties and potential consequences of incorrect or suboptimal management measures. Louisiana participates in the GMFMC process and manages the shrimp fishery in state waters consistent with federal management, which is managed under precautionary approach guidelines (as shown above).		

[1] FAO 2005-2015. *World inventory of fisheries. Precautionary approach to fisheries management*. Issues Fact Sheets. Text by Serge M. Garcia. Bibliographic citation [online]. Rome. Updated 27 May 2005. [Cited 25 January 2015]. http://www.fao.org/fishery/topic/13302/en

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[4] Restrepo, V.R. et al (1998) "Technical Guidance On the Use of Precautionary Approaches to Implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act" NOAA Technical Memorandum. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/documents/ns1_restrepo_et_al_1998.pdf

[5] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[6] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[7] 50 C.F.R. § 600.310 http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[8] Nance, James, Walter Keithly, Jr., Charles Caillouet, Jr., John Cole, Wilson Gaidry, Benny Gallaway, Wade Griffin, Rick Hart, and Mike Travis. 2008. *Estimation of effort, maximum sustainable yield, and maximum economic yield in the shrimp fishery of the Gulf of Mexico*. NOAA Technical Memorandum NMFS-SEFSC 570. http://docs.lib.noaa.gov/noaa_documents/NMFS/SEFSC/TM_NMFS_SEFSC/NMFS_SEFSC_TM_570.pdf

[9] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[10] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[11] "List of Fisheries" *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/interactions/lof/

7.5.1 (b) Has the absence of adequate scientific information been used as a reason for postponing or failing to take conservation and management measures? **No...**[1] **Occasionally...** [½] **Often...**[0]

Extent of compliance		
No	**Occasionally**	**Often**
The MSA specifically prevents the absence of scientific information as a reason to postpone conservation and management measures through National Standard 6 (NS6). NS 6 requires the following:[1] - To the extent practicable, FMPs should provide a suitable buffer in favor of conservation. Allowances for uncertainties should be factored into the various elements of an FMP. Examples are: (i) *Reduce OY*. Lack of scientific knowledge about the condition of a stock(s) could be reason to reduce OY. (ii) *Establish a reserve.* Creation of a reserve may compensate for uncertainties in estimating domestic harvest, stock conditions, or environmental factors. (iii) *Adjust management techniques.* In the absence of adequate data to predict the effect of a new regime, and to avoid creating unwanted variations, a Council could guard against producing drastic changes in fishing patterns, allocations, or practices. (iv) *Highlight habitat conditions.* FMPs may address the impact of pollution and the effects of wetland and estuarine degradation on the stocks of fish; identify causes of pollution and habitat degradation and the authorities having jurisdiction to regulate or influence such activities; propose recommendations that the Secretary will convey to those authorities to alleviate such problems; and state the views of the Council. The GMFMC Shrimp FMP is in compliance with all mandates of the MSA and has not used a lack of scientific information as a basis for not implementing conservation measures.[2]		

LDWF has also taken several proactive management measures for the shrimp fishery to ensure conservation of the fishery prior to scientific evidence, including closed areas, and closed seasons to protect habitat and smaller shrimp.		

[1] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[2] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015.
http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

7.5.2 Has there been an attempt to determine for the stock both safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), and, at the same time, the action to be taken if they are exceeded?

- Have target reference point(s) been established? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In part**	**No**
Limit and target reference points have been established for the fishery. Currently, The target for each stock is MSY. Amendment 13 of the Shrimp FMP established MSY for each stock and determined that there is no biological reason to set OY below MSY because penaeid shrimp are annual stocks whose abundance in a given year is dictated primarily by environmental conditions.[1] Recent changes have been made to the model used in stock assessments for penaeid shrimp in the Gulf of Mexico to improve assessments. Previously, a VPA model was used in Gulf shrimp stock assessments; however, recently the SSC approved a new Stock Synthesis model as the best scientific model available for these species. Due to the changes in the model outputs, the GMFMC changed the SDC for penaeid shrimp species to fit with the new assessment model outputs. These changes have been adopted through Amendment 15. The new reference points are:[2] **MSY:** Brown shrimp: MSY is 146,923,100 lbs. of tails White shrimp: MSY is 89,436,907 lbs. of tails		

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

(7.5.2 cont.)

- Have limit reference points been established? **Yes...**[1] **In part...**[½] **No...**[0]

Extent of compliance		
Yes	**In part**	**No**
Amendment 13 set the original limit reference points for the fishery as minimum		

parent stock size. Overfishing and Overfished thresholds for brown and white shrimp were:[1]

	overfishing	overfished
brown shrimp	125,000,000 individuals (November – February)	63,000,000 individuals (November – February)
white shrimp	330,000,000 individuals (May – August)	165,000,000 individuals (May – August)

Brown shrimp and white shrimp stocks have been monitored by NOAA Fisheries since 1970, and have remained above the minimum parent stock size thresholds; therefore, have never been determine overfished or overfishing.

Changes to the model used in stock assessments for penaeid shrimp in the Gulf of Mexico from a VPA model to a Stock Synthesis model required changes to the SDC for penaeid shrimp species to fit with the new assessment model outputs. These changes have recently been adopted through Amendment 15.
The new reference points are:[2]

Overfishing:
The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the fishing mortality rate at MSY (F_{MSY}).

- Brown shrimp: $F_{MSY} = 9.12$
- White shrimp: $F_{MSY} = 3.48$

Overfished:
The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum spawning stock biomass at MSY (SSB_{MSY}).

- Brown shrimp: SSB_{MSY} is 6,098,824 lbs. of tails
- White shrimp: SSB_{MSY} is 365,715,146 lbs. of tails

These values will be updated every 5 years through the framework procedure, unless changed earlier by the GMFMC.

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

(7.5.2 cont.)

- Have data and assessment procedures been installed measuring the position of the fishery in relation to the reference points established? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA SEFSC Galveston Lab conducts ongoing monitoring and research for the Gulf of Mexico shrimp fishery and produces an annual stock assessment report for each shrimp species.[1] GMFMC SSC and Standing Shrimp SSC review stock		

assessments annually to determine the status of the fishery against established reference points. The current stock assessment model, updated in 2012, now produces different outputs than the previous VPA model that was used at the time reference points were set. GMFMC and NOAA Fisheries have updated the SDC for shrimp to match with the new model outputs.[2]		

[1] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

(7.5.2 cont.)

- Have management actions been agreed to in the eventuality that data sources and analyses indicate that these reference points have been exceeded? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Penaeid shrimp in the Gulf of Mexico are exempt from requirements for ACLs and Accountability measures (AMs) because they have a life cycle of approximately one year. MSA Section 600.310(h)(2) states:[1] (2) *Exceptions from ACL and AM requirements*—(i) *Life cycle*. Section 303(a)(15) of the Magnuson-Stevens Act" shall not apply to a fishery for species that has a life cycle of approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species" (as described in Magnuson-Stevens Act section 303 note). This exception applies to a stock for which the average length of time it takes for an individual to produce a reproductively active offspring is approximately 1 year and that the individual has only one breeding season in its lifetime. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule. Amendment 15 updating the SDC for shrimp, also updated actions to be taken should reference points be exceeded as follows:[2] - "Annual stock assessments are conducted for the penaeid shrimp species in the Gulf. If MFMT is exceeded for two consecutive years, the appropriate committees and/or panels (e.g. stock assessment panels, advisory panels, SSCs) would convene to review changes in apparent stock size, changes in fishing effort, potential alterations in habitat or other environmental conditions, fishing mortality and other factors that may have contributed to the decline." Furthermore, the MSA Section 305 (c) allows for the promulgation of emergency actions. The Secretary of Commerce may promulgate an emergency regulation to respond to an emergency, overfishing, public health or oil spill event, or at the request of GMFMC.[3] Such emergency regulations may remain in effect until the		

circumstance no longer existed, provided that there is an opportunity for public comment after the rule is published. Emergency regulations may address the following situations: - Ecological- to prevent overfishing or other serious damage to the resource or habitat - Economic- to prevent a significant direct economic loss - Social- to prevent a significant community impact or conflict between user group - Public Health- to prevent significant adverse health effects to fishery participants and/or consumers Louisiana also has the ability to promulgate emergency regulations within state waters when there is evidence of an emergency, such as overfishing or a severe disaster. Louisiana Revised Statutes 56:6.1 grants the Secretary of LFWC the authority to institute a closure of a fishery not to exceed a length of seven days after the next Commission meeting, without having to bring the matter before the Commission or other regulatory bodies.[4] This allows for the immediate termination of activities that may be harmful either to the fishery or the people of Louisiana in the event of an emergency situation.		

[1] 50 C.F.R. § 600.310 http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[3] NMFS. *Policy Guidelines for Use of Emergency Rules*. January 2007. http://www.nmfs.noaa.gov/sfa/management/councils/training/2014/c_h2_policy_directive_01-101-07.pdf

[4] La. R.S. 56:6.1 https://legis.la.gov/Legis/Law.aspx?d=105431

7.5.5 (a) Have contingency plans been agreed to in advance on the appropriate temporary management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the resource?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Based on MSA Section 600.310 (h)(2), penaeid shrimp in the Gulf of Mexico are exempt from requirements for ACLs and Accountability measures (AMs) because they have a life cycle of approximately one year; however, they are still required to have SDC, MSY, OY, ABC, and an ABC control rule.[1] The current actions defined in the event that stock should drop below limit reference points are established in Amendment 15 as follows:[2] "Annual stock assessments are conducted for the penaeid shrimp species in the Gulf. If MFMT is exceeded for two consecutive years, the appropriate committees and/or panels (e.g. stock assessment panels, advisory panels, SSCs) would convene		

to review changes in apparent stock size, changes in fishing effort, potential alterations in habitat or other environmental conditions, fishing mortality and other factors that may have contributed to the decline." Additionally, the MSA Section 305 (c) allows for the promulgation of emergency actions. The Secretary of Commerce may promulgate an emergency regulation to respond to an emergency, overfishing, public health or oil spill event, or at the request of GMFMC.[3] Such emergency regulations may remain in effect until the circumstance no longer existed, provided that there is an opportunity for public comment after the rule is published. Emergency regulations may address the following situations: - Ecological: to prevent overfishing or other serious damage to the resource or habitat - Economic: to prevent a significant direct economic loss - Social: to prevent a significant community impact or conflict between user groups - Public Health: to prevent significant adverse health effects to fishery participants and/or consumers **Louisiana:** In Louisiana, there are currently no specific predetermined actions for the shrimp fishery; however, the fishery is managed through seasonal opening and closures based on biological sampling allowing for greater flexibility and control by LDWF to response to the status of the stock. In the case of an emergency (including evidence of overfishing or a severe disaster), the Secretary of the LFWC has the authority to institute a closure of a fishery not to exceed a length of seven days after the next Commission meeting, without having to bring the matter before the Commission or other regulatory bodies.[4] This allows for the immediate termination of activities that may be harmful either to the fishery or the people of Louisiana in the event of an emergency situation (a recent example of this was the closure of fisheries during the Deepwater Horizon Oil Spill).		

[1] 50 C.F.R. § 600.310
http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

[2] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[3] NMFS. *Policy Guidelines for Use of Emergency Rules.* January 2007.
http://www.nmfs.noaa.gov/sfa/management/councils/training/2014/c_h2_policy_directive_01-101-07.pdf

[4] La. R.S. 56:6.1 https://legis.la.gov/Legis/Law.aspx?d=105431

7.5.5 (b) Have these emergency (temporary) responses been agreed to due to:

(i) - natural phenomena adversely impacting the stock? **Yes**...[1] **In Part**...[½] **No**...[0]

Extent of compliance		
Yes	**In Part**	**No**
At both the state and federal level, responses to natural phenomena adversely		

impacting the stock would follow the same procedures and emergency actions detailed above in response to 7.5.5(a).		

7.5.5 (b)(ii) - fishing adversely impacting the stock? **Yes...**[1] **In Part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
At both the state and federal level, responses to fishing adversely impacting the stock would follow the same procedures and emergency actions detailed above in response to 7.5.5(a).		

7.6 Management measures

7.6.1 Is the level of fishing permitted commensurate with the current state of the fishery resources? **Yes...**[1] **In Part...**[½] **No...**[0]

Extent of compliance		
Yes	**In Part**	**No**
	<u>Federal:</u> The Gulf of Mexico shrimp fishery requires a Gulf of Mexico Shrimp Permit (GMSP) to operate in federal waters of the EEZ, and is currently under a 10-year permit moratorium. No new permits have been added to the fishery since 2005. Permits may be transferred; however, permits that are not renewed or transferred are terminated and will no longer be issued for the fishery. The permit moratorium was put in place by Amendment 13 based on economic goals for the fishery and Amendment 13 notes "that the fishery has remained above overfishing and overfished definitions since those definitions were established and current capacity is not a threat to the resource."[1] Since the implementation of the moratorium, license numbers have decreased from 1933 permits in 2007 to 1470 permits in 2014.	

Year	Number of Valid Permits Each Year	Number of Surrendered Permits Each Year	Number of Permits Terminated Each Year*	Cumulative Number of Permits Lost from the Fishery
2007	1,933	0	NA	NA
2008	1,907	0	26	26
2009	1,722	1	184	211
2010	1,633	1	88	300
2011	1,582	0	51	351
2012	1,534	0	48	399
2013	1,501	0	33	432
2014	1,470	0	31	463

Source: NMFS Southeast Regional Office (SERO) Permits Database

The 10-year moratorium put in place by Amendment 13 expires in December of 2016 and the GMFMC is currently working on the development of Amendment 17 to determine if the moratorium will expire, be extended, or development of a limited-access system will be put in place. The draft scoping document for Amendment 17 provides updated analysis of the shrimp fleet and indicates that the current number of permits in the fishery is not capable of overfishing any stocks.[2] This is consistent with previous analyses in 2006 and 2008 indicating that effort in

the fishery has been operating well below MSY for several years.[3,4]

Louisiana:

The shrimp fishery in Louisiana state waters is an open access fishery. A commercial fisherman's license and gear licenses (shrimp trawl, butterfly net, skimmer net, or cast net) are required to harvest shrimp in Louisiana waters; however, there is no limit on the number of licenses available.[5] LDWF monitors the number of licenses sold annually and monitors catch and fishing effort through the trip ticket program. The Louisiana Shrimp FMP identifies effort management in the 'Current Issues and Management Options' section as follows:[6]

> "The Louisiana shrimp fishery is an open access fishery. Since 2000, participation in the fishery has declined, as evidenced by steep reductions in license sales and fishing effort due to low shrimp prices, rising fuel costs, competition with imported products, and impacts of hurricanes. Despite current reduced levels of participation in the fishery, there is potential for rapid expansion of the fishery at some point in the future. Unrestricted participation may lead to increased competition within the fishery, reduced profitability of individual fishermen, as well as increased user conflicts. Consideration should be given to limiting access and effort in the fishery. Options:
>
> - Develop and implement a professional development program designed to increase and elevate professionalism in the fishery. New license applicants could be required to enroll in and complete educational training in proper fishing techniques necessary for sustainability of the shrimp resource, proper techniques for the best capture and presentation of shrimp for marketability, reducing conflicts with other user groups, and bycatch reduction.
> - Evaluate fishing capacity for the shrimp fishery compared to current participation and effort.
> - Evaluate other methods for limiting effort in the fishery, including by not limited to:
>   - Raising license fees
>   - Requiring drug testing for entry into the fishery
>   - Eliminating latent licenses
>   - Qualifying participation based on license history, historical landings levels, or historical values of landings
> - Establishing a license buyback program
> - Requiring license endorsements that scale/tier trip limits
> - Removing gear license transferability

While effort in the fishery has declined in recent years and current fishing effort is commensurate with the state of the stock, the amount permitted (which is currently unrestricted) has the potential to exceed a level commensurate with the state of fishery resources if the fishery should expand in the future.

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[3] GMFMC Ad Hoc Shrimp Effort Working Group. "Estimation of Effort, Maximum Sustainable Yield, and Maximum Economic Yield in the Shrimp Fishery of the Gulf of Mexico" 2006. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINAL_AdHocEffortReport_1.pdf

[4] Nance, James, Walter Keithly, Jr., Charles Caillouet, Jr., John Cole, Wilson Gaidry, Benny Gallaway, Wade Griffin, Rick Hart, and Mike Travis. 2008. *Estimation of effort, maximum sustainable yield, and maximum economic yield in the shrimp fishery of the Gulf of Mexico*. NOAA Technical Memorandum NMFS-SEFSC 570. http://docs.lib.noaa.gov/noaa_documents/NMFS/SEFSC/TM_NMFS_SEFSC/NMFS_SEFSC_TM_570.pdf

[5] "Harvesters Licenses and Fees" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/harvest-licenses-and-fees

[6] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 67. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.6.2 Are fishing vessels allowed to operate on the resource in question without specific authorization? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
No	**some**	**no**
Federal: GMFMC requires all vessels intending to harvest shrimp in EEZ waters to be in possession of the appropriate permit. No new permits will be issued, as a permit moratorium is currently in effect.[1] The U.S. Code of Federal Regulations prohibits any person without a permit, license, or endorsement from engaging in an activity which requires a valid Federal permit, license, or endorsement.[2] **Louisiana:** Any vessel commercially fishing for shrimp in Louisiana territorial waters must hold a commercial fisherman's license and proper gear licenses to catch and sell shrimp.[3] LDWF also requires a recreational license be obtained by harvesters catching shrimp for bait or personal consumption. Violations of the fishing regulations are subject to fines and revocation of licensure. License information and fees are posted on the LDWF website.		

[1] GMFMC. *Commercial Fishing Regulations for Gulf of Mexico Federal Waters.* January 2015. http://gulfcouncil.org/fishing_regulations/CommercialRegulations.pdf

[2] 50 C.F.R. § 622.13 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_113

[3] "Shrimp Regulations" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/fishing/shrimp-1

7.6.3 (a) Have attempts been made to measure fleet capacity operating in the fishery?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Kirkely et al. (2006) includes an analysis of the Gulf of Mexico shrimp fishery to determine the level of overcapacity and costs associated with reducing overcapacity within the fleet.[1] This analysis utilized the average annual yield of shrimp between 1981 and 2001 (101.6 million pounds) as an equivalent to MSY, and used this as the target level in determining the overcapacity of the fishery. The fishery was broken down into subgroups; capacity was determined for each division and then extrapolated to estimate total fleet level activity. Amendment 13 of the Gulf of Mexico Shrimp FMP established a 10-year moratorium on the issuance of commercial shrimp vessel permits capping the number of vessels in the federal fishery.[2] Amendment 13 notes that the fishery has remained above overfishing and overfished definitions since those definitions were established and current capacity is not a threat to the resource; however, economically the fishery has been operating at a negative profit margin, and a fewer number of vessels in the fishery would allow more profitable harvest of available shrimp resources. The 10-year moratorium put in place by Amendment 13 expires in December of 2016 and the GMFMC is currently discussing Amendment 17 to determine if the moratorium will expire, be extended, or development of a limited-access system will be put in place. GMFMC and NOAA Fisheries are currently working to assess the capacity of the fishery and determine the appropriate number of permits through Amendments 17A and 17B.[3,4] For additional details, refer to 7.1.8(a). **Louisiana:** LDWF requires a commercial fishing license and shrimp gear licenses to harvest shrimp in Louisiana waters. A commercial fisherman's license allows fishermen to harvest a variety of species and is not specific only to shrimping. Gear licenses, however, are required for each of the commercial shrimp gear types (shrimp trawl, skimmer net, butterfly net and cast net) and the number of fishermen specifically participating in the shrimp fishery can be estimated based on the number of gear licenses sold.[5] The Louisiana Shrimp FMP notes that it is difficult to quantify the exact number of fishermen participating in the commercial shrimp fishery because gear licenses are transferrable.[6] Additionally, analysis of trip ticket reports could also provide the total number of fishermen that report shrimp sales through the trip ticket program in any given year. The Louisiana Shrimp FMP also notes that there is a large disparity between the number of gear licenses sold annually and the number of fishermen reporting shrimp catch. Anecdotal evidence suggests that many recreational fishermen purchase commercial gear and licenses yet only harvest shrimp for personal consumption or other recreational uses; however, the extent of this practice is currently unknown. LDWF estimates based on gear licenses indicate that in 2000 and 2001, approximately 10,000 commercial fishermen held shrimp gear licenses.[7] This number steadily declined to a low of approximately 5,600 licensed shrimpers in 2008. Trip ticket reports indicate that about 7,000 harvesters reported shrimp sales in 2001, then number of harvesters reporting shrimp sales declined to a low of 2,912 in 2008.		

[1] James E. Kirkley, John M. Ward, James Nance, Frank Patella, Karyl Brewster-Geisz, Chris Rogers, Eric Thunberg, John Walden, Will Daspit, Brad Stenberg, Steve Freese, Jim Hastie, Stephen Holiman, and, Mike Travis, 2006. *Reducing Capacity in U.S. Fisheries*. NOAA Technical Memorandum NMFS-F/SPO-76. http://spo.nmfs.noaa.gov/tm/tm76.pdf

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Draft options for Amendment 17A of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-4PHDraftShrimp17A

[4] GMFMC. *Draft options for Amendment 17B of Gulf of Mexico Shrimp Fishery Management Plan*. September 2015. http://gulfcouncil.org/council_meetings/BriefingMaterials/BB-10-2015/D-%205%20Shrimp%2017b-%20OY%20and%20Permit%20Pool.pdf

[5] "Commercial Shrimp License Requirements" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[6] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 27. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[7] Bourgeois et al., 2015, p. 28

7.6.3 (b) Have mechanisms been established where excess capacity exists to reduce capacity to levels commensurate with sustainable use of the resource? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Amendment 13 of the Gulf of Mexico Shrimp FMP established a 10-year moratorium on the issuance of commercial shrimp vessel permits capping the number of vessels in the federal fishery.[1] Amendment 13 notes that the fishery has remained above overfishing and overfished definitions since those definitions were established and current capacity is not a threat to the resource; however, economically the fishery has been operating at a negative profit margin, and a fewer number of vessels in the fishery would allow more profitable harvest of available shrimp resources. Amendment 13 also notes that, due to competition with foreign imports and rising fuel costs, the number of vessels in the fleet has declined and was expected to continue to decline until approximately 2012 when the number of participants reached a more profitable level. Since the implementation of the moratorium, license numbers have been reduced from 1933 permits in 2007 to 1470 permits in 2014 and are continuing to decline.[2] The 10-year moratorium put in place by Amendment 13 expires in December of 2016 and the GMFMC is currently in discussions on the development of Amendment 17 to determine if the moratorium will expire, be extended, or development of a limited-access system will be put in place.		

GMFMC has determined limit reference points for the fishery and defined actions to be taken if limit reference points are exceeded. The current actions defined in the event that stock should drop below limit reference points are:[3] **Louisiana:** There is currently no limit on the fishing capacity for the shrimp fishery in Louisiana waters. Licenses are required for commercial, recreational and live-bait shrimping in and LDWF monitors license numbers annually. Poor economic conditions of the fishery over the last decade have continued to reduce the number of participants in the fishery but, as noted in the Louisiana Shrimp FMP, there is potential for rapid expansion of the fishery in the future, which could have negative consequences.[4]		

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

[3] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 67. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.6.5 Has the fishery been regulated in such a manner that conflict among fishers using different vessels, gear and fishing methods are minimized? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The original Shrimp FMP implemented in 1981 identified several areas of user conflicts both with direct use of shrimp resources (recreational, live-bait, commercial, inshore and offshore fleets) and with other marine resource users.[1] 1) Conflicts have arisen between direct users over preferred size of harvest. Some users prefer smaller shrimp typically harvested inshore, especially for the live-bait industry; however, offshore vessels harvest larger shrimp for food consumption. Most states have developed seasons for harvest of shrimp designed to accommodate multiple user needs. Additionally, area and seasonal closures (Texas closure and Tortugas closure) have also been set for federal waters to allow for protection of smaller shrimp in some areas until they reach a larger size. Most Gulf states have similar regulations for various direct user groups to address different needs and conflicts have largely been minimized. (see below for specifics on Louisiana) 2) Other direct user conflicts have occurred between ethnic groups within the commercial shrimp fishery. A large influx of Vietnamese fishermen in to 1970s caused conflicts with local fishermen; however, programs developed by state agencies and others including translation of regulations materials		

into Vietnamese, and education and training programs have help reduce these conflicts.

3) High incidental catch of finfish and shellfish has created conflicts between shrimps and other fisheries that may utilize species discarded by the shrimp fishery. Juvenile groundfish and other species are typically not retained by shrimpers because there is low economic value for them and retaining them would reduce available space for retaining shrimp catch. Regulations developed to reduce bycatch including required BRDs have significantly decreased bycatch of finfish within the shrimp fishery and additional actions, including effort reductions and seasonal closures (if needed) have also helped in reducing bycatch.[2,3]
4) Incidental take of sea turtles has created significant conflicts between commercial shrimpers and environmental groups. Requirements for TEDs, and guidelines on proper handling, resuscitation and release of sea turtles have significantly reduced sea turtle mortality in the Gulf of Mexico shrimp fishery.[4,5,6] Additionally, the shrimp industry, federal and state agencies have also been active in other conservation efforts to aid the recovery of sea turtle populations including head-start programs to raise hatchling sea turtles in captivity for later release, nest protection programs in Florida, Texas and Mexico, and education programs to raise awareness among user groups regarding sea turtle conservation actions.[7,8]
5) Gear conflicts occur between shrimpers and stone crab fishermen. The GMFMC Shrimp FMP directly addresses conflicts between the shrimp and stone crab fisheries and established five zones within the EEZ to separate shrimp trawling and stone crab trap activity.[9]
6) Underwater obstructions that cause loss of gear or trawlable bottom areas in the Gulf include artificial reefs, and oil and gas activities/structures, among others. Measure 10 of the Shrimp FMP adopted by the council is "The GMFMC will attempt to reduce, where feasible, the loss of offshore trawlable bottom by establishing within GMFMC a committee to monitor and review construction of offshore reefs, with attention to the needs of reef fish, and shrimp user groups." Furthermore, the Texas Sea Grant program developed "hang" books as a guide for shrimp vessels in the Gulf of Mexico documenting bottom obstructions and areas to avoid trawling due to potential interactions.[10,11,12] Additionally, there are federal laws in place that provide for compensation to fishermen to cover damage to gear and vessels from underwater obstructions.

<u>Louisiana</u>:

The Louisiana Shrimp FMP identifies the following user conflicts:[13]

- Conflicts between commercial crab trap fishermen and commercial shrimpers was identified by Guillory et al. (2001). Highly productive areas for crabbing and shrimping overlap in Louisiana waters and incidences of crab traps caught in shrimp trawl gear have led to gear damage and losses for both fisheries. Regulations requiring crab trap identification markings and visibility, handling of traps by shrimpers, and annual derelict trap cleanup events have helped to reduce conflicts between these two fisheries

and the Louisiana Crab and Shrimp Task Forces continue to work together to resolve conflicts. - Conflicts also occur between shrimpers and other users due to high risk of interactions with underwater obstructions that may damage shrimp gear or vessels. Some sources of obstructions include: 1) oyster lease holders are required to mark their lease areas and many lease holders use PVC pipes to mark boundaries. PVC pipes set close together may interfere with the ability for shrimp boats to fish the area without damaging their gear or vessel 2) buoys, cables and recorders placed in the water for geoseismic surveys may also cause damage to shrimp gear, 3) abandoned or lost oil field equipment and displaced hurricane debris are other sources of obstructions that often cause gear damage to shrimp fishermen. - To mitigate financial losses caused by underwater obstructions, Louisiana created the Fisherman's Gear Compensation Program. This program is administered by the LDNR and provides compensation to fishermen for loss of equipment resulting from hitting or snagging underwater obstructions. Louisiana also created the Louisiana Underwater Obstruction Removal Program run by the LDNR Office of Conservation, which identifies and removes underwater obstructions in Louisiana's navigable waters. - Special Bait Dealer permits allow harvesters to catch shrimp for bait purposes outside of open shrimp seasons under certain harvest regulations. Other shrimp users, primarily commercial shrimpers, have raised concerns that heavy bait shrimp fishing during certain seasons, such as prior to the opening of commercial shrimp seasons, could damage the resource by harvesting smaller shrimp and recommendations have been made to strict live-bait shrimp during these times.		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_156

[3] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[4] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[5] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_156

[6] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[7] "Sea Turtles" *NOAA Fisheries Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/seaturtles/index.html

[8] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 47. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[9] GMFMC. *Amendment 3 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://gulfcouncil.org/fishery_management_plans/shrimp_management.php

[10] GMFMC, 1981.

[11] Gary Graham, David Veal, and Bill Hosking. *"Hangs" and Bottom Obstructions of the Mississippi/Alabama Gulf*. TAMU-SG-83-505. Texas Sea Grant, 1983 http://texasseagrant.org/assets/uploads/publications/1983/83-505.pdf

[12] Gary Graham. *Bottom Fishing Obstructions: Texas/Louisiana Gulf*. TAMU-SG-76-502. Texas Sea Grant. 1975. http://texasseagrant.org/assets/uploads/publications/1976/76-502.pdf

[13] Bourgeois et al., 2015, p. 39.

7.6.6 In the course of deciding on use, conservation and management of the resource, were relevant national laws and regulations relating to the traditional practices needs and interests of indigenous people and local fishing communities highly dependent on these resources for their livelihood taken into account? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
There are no indigenous groups identified in Louisiana that rely on or utilize fishery resources in traditional practices; however, several coastal communities in Louisiana have been identified as fishing communities.[1,2,3] NOAA Fisheries, GMFMC, and LDWF address the needs of these communities through industry engagement activities including industry task forces, scoping meetings, public hearings, and written comment periods.[4,5,6,7,8,9] The draft proposal for GMFMC Amendment 17 contains updated analysis of fishing communities across the Gulf, community dependence on Gulf shrimp and community resilience.[10]		

[1] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume I: Ascension Parish through Lafayette Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/ascension_lafayette.pdf

[2] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume II: Lafourche Parish through St. Landry Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/lafourche_stlandry.pdf

[3] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume III: St. Martin Parish through Vermillion Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/stmartin_vermilion.pdf

[4] La. R.S. 42:12-28 (Open Meetings Law) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[5] "Commission agendas" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/commissionagenda1

[6] "Action Items" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/action-items

[7] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

[8] GMFMC, 2012. *Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[9] "Meetings" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/council_meetings/index.php

[10] GMFMC. *Draft options paper for Amendment 17 of Gulf of Mexico Shrimp Fishery Management Plan*. August 2015. http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-08-2015/D%20-%204%20Revised%20Draft%20Options%20Amendment%2017%20-Shrimp%20Permit%20Moratorium%20072915.pdf

7.6.7 Have the cost-effectiveness and social impact been considered in the evaluation of alternative conservation and management measures? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The MSA National Standard 7 states "*Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication."* The Guidelines to NS7 requires that "supporting analyses for FMPs should demonstrate that the benefits of fishery regulation are real and substantial relative to the added research, administrative, and enforcement costs, as well as costs to the industry of compliance. In determining the benefits and costs of management measures, each management strategy considered and its impacts on different user groups in the fishery should be evaluated."[1] Additionally, National Standard 8 requires "*Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities*"[2] SEC. 303 (a)(9) of the MSA requires that FMPs include a FIS for the plan or amendment.[3] The FIS includes an assessment of the likely biological, social, economic, and administrative effects, if any, of the conservation and management measures on fishery participants and their communities as well as participants in other fisheries conducted in adjacent areas. NOAA Fisheries also requires a RIR for each regulatory action of public interest, which provides a review of the level and incidence of impacts associated with the		

action, a review of the problems and policies prompting the action, and ensures that the agency has comprehensively considered all alternatives.[4] The GMFMC Shrimp FMP complies with all requirement of the MSA and associated National Standards guidelines. The Shrimp FMP and each amendment contain assessments of economic and social impacts when considering each alternative for management actions.[5] **Louisiana:** If any change in management is put before the LWFC, including adoption of alternative management measures that would affect members of the shrimp industry, a Fiscal and Economic Impact Statement must be prepared to summarize potential economic and social effects, and what costs could be incurred by the regulation change.[6] The Louisiana Administrative Procedures Act (APA) requires all proposed rules to be published in the *Louisiana Register* 100 days prior to taking action on any proposed rule and requires that a Fiscal and Economic Impact Statement be prepared which is published with the proposed rule.[7] When considering new regulations, LDWF consults with industry members directly and through the Louisiana STF for each regulation change, allowing LDWF staff to explore the economic and social impacts of various management strategies prior to proposing regulation changes to LWFC.[7]		

[1] 50 C.F.R. § 600.340 National Standard 7—Costs and Benefits. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/documents/national_standard_7_cfr.pdf

[2] 50 C.F.R. § 600.345 National Standard 8—Communities http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/documents/national_standard_8_cfr.pdf

[3] MSA § 303 (a)(9) http://www.nmfs.noaa.gov/sfa/magact/mag3.html

[4] "Guidance for Conducting Economic and Social Analyses of Regulatory Actions. *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/economic_social/index.html

[5] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[6] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.54 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[7] La. R.S. 49:950 (Administrative Procedures Act) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[8] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

7.6.8 Are procedures in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review to revise or abolish them in the light of new information?

(i) - Have review procedures been established? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: The GMFMC develops FMPs for specific fisheries in the Gulf's EEZ. GSFMC proposed management measures become federal regulations through the implementation of these rules by the Secretary of Commerce. The regulations and FMPs are reviewed annually and updated/modified after public review to accommodate changing conditions and needs of the industry or fishery.[1] GMFMC and the NOAA Fisheries also use the electronic logbook (ELB) program to assess the status of shrimp stocks in the Gulf of Mexico.[2] The ELB program provides data on Gulf shrimping efforts that allows both GMFMC and NMFS to review current regulations and determine the impact of proposed management measures.[3] NMFS follows set procedures for regulation revision. The Assistant Administrator for Fisheries (AA) is responsible for considering petitions to amend and reviewing existing regulations for possible revision or revocation. Existing rules chosen for review include (but are not limited to) those regulations: • For which there is no relevant need • Which have received significant complaints or suggestions • Which carry heavy burdens on those affected • Which need clarification • Which are duplicated • Which have not been evaluated in three or more years A review notice is included in the Regulatory Agenda. The Regulatory Flexibility Act requires an examination of what impacts the rule change may have on a substantial number of small entities (businesses, organizations, governmental jurisdictions).[4] **Louisiana:** The Louisiana Shrimp FMP is considered a living document and can be taken in front of the STF, LWFC or other body for review and amendment as new research and information on the fishery is available. Annual plan working groups will evaluate new information obtained from monitoring programs, document progress toward management objectives and research needs, and will revise the management plan as necessary.[5]		

[1] "Fishery Management Plans and Amendments" Gulf of Mexico Fishery Management Council. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/index.php

[2] "SPGM Electronic Log Book" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/

[3] GMFMC. *Framework Action to Establish Funding Responsibilities for the Electronic Logbook Program in the Shrimp Fishery of the Gulf of Mexico*. 2013. http://gulfcouncil.org/docs/amendments/Final%20Shrimp%20ELB%20Abbreviated%20Framework.pdf

[4] NMFS. *Operational Guidelines, Fishery Management Plan Process*. Silver Springs, MD, 1997. http://www.nmfs.noaa.gov/sfa/domes_fish/OperationalGuidelines/OGdevelop_regs.htm#existing

[5] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.8 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.6.8 (ii) - Does a flexible mechanism for revision of management measures exist?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Similar to the above answer, regulations and FMPs created and proposed by GMFMC are reviewed annually and updated/modified after public review to accommodate changing conditions and needs.[1] Amendments may be made to original FMPs. In order for an amendment to be implemented, it must go through a scoping process, where GMFMC gathers suggestions and ideas for all stakeholders. Public hearings are held to gain feedback on potential impacts and alternative strategies. Once these two actions have been completed, GMFMC must take final action by choosing an appropriate management measure by creating a rule that is necessary and appropriate for the implementation of the amendment. Once approved by the Secretary of Commerce, the rule is published in the Federal Register. On a national level, the NOAA Fisheries is tasked with examining the impacts of proposed rules on small entities, guiding the promulgation of new rules, and reviewing the need for existing rules.[2] This process of revision is open to the public, allowing anyone to petition NOAA Fisheries (pursuant to 5 U.S.C. 553(e)) to issue, amend or repeal a rule.[3] Through these processes, both GMFMC and NOAA Fisheries allow for flexibility within the management of the Gulf shrimp industry. **Louisiana:** Rules and regulations pertaining to the shrimp fishery in Louisiana are promulgated through the Louisiana Revised Statutes, Title 56, and the Louisiana Administrative Code, Title 76.[4] The primary authority for managing shrimp is the Louisiana legislature, which enacts legislation through the Louisiana Revised Statutes. Laws are enacted through the legislative process and typically LDWF will develop legislative packages that are then sponsored by legislators; however, legislators also occasionally sponsor their own bills. The Louisiana legislature has delegated some authority to the LWFC and regulations promulgated by the LFWC are enacted through the Louisiana Administrative Code and follow the Administrative Procedures Law.[5] The LWFC has the authority to control seasons, times, areas, size limits, quotas, take and possession limits and other authorities. The commission may also delegate certain authorities to the Secretary of LDWF. The Louisiana STF has no direct management		

authority but is charged with advising LDWF and LWFC on matters pertaining to the fishery. This framework, allowing for different levels of authority and input into the rule-making process, creates flexibility in the review and revision process.		

[1] "Fishery Management Plans and Amendments" Gulf of Mexico Fishery Management Council. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/index.php

[2] NMFS. *Operational Guidelines, Fishery Management Plan Process*. Silver Springs, MD, 1997. http://www.nmfs.noaa.gov/sfa/domes_fish/OperationalGuidelines/OGdevelop_regs.htm#existing

[3] NMFS. *Operational Guidelines, Fishery Management Plan Process*. Silver Springs, MD, 1997. http://www.nmfs.noaa.gov/sfa/domes_fish/OperationalGuidelines/OGdevelop_regs.htm#existing

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.8 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[5] La. R.S. 49:950 (Administrative Procedures Act) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[6] Bourgeois et al., 2015. p.54

7.6.9 (a) Are appropriate measures being applied to minimize:

(i) - waste and discards? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	Initial bycatch ratio estimates for the Gulf of Mexico shrimp fishery from 1970s were approximately 10:1 (bycatch to shrimp), with some estimates based on season and area as high as 13.7:1.[1] Since that time, the implementation of TEDs, BRDs and significant reductions in shrimp effort have all contributed to considerable reduction in the bycatch of this fishery. Estimates in 2009 concluded that bycatch ratios for the offshore otter trawl fleet had remained consistent at approximately 4:1 since 2000.[2] The 2012 report by Scott-Denton et al, utilizing observer data on the offshore fleet, determined that total bycatch to shrimp ratios dropped to 2.5:1 (2:1 for finfish to shrimp).[3] Currently, observer data are the only long-term data set documenting bycatch of the fishery and observer coverage is limited (1-2%coverage in the federal fleet and a small number of observers on inshore skimmer vessels only). **Federal:** Several regulations have been designed to minimize waste and discards in the shrimp fishery. According to the U.S. Code of Federal Regulations, shrimp trawl vessels must have a certified BRD installed on each net for fishing on their vessel.[4] To be certified by the NOAA Harvesting Systems Unit, a BRD must reduce finfish bycatch by at least 30% by weight.[5] NOAA Harvesting Systems Unit continues to research and certify new BRDs designs in an effort to continually improve bycatch reduction in the shrimp trawl fishery.[6] Furthermore, Amendment 14 established seasonal/area closures that can be implemented if an annual assessment of red snapper bycatch indicates that bycatch in the shrimp trawl fishery has exceeded its target limit.[7]	

TEDs are also required on all otter trawls and in skimmer trawls (exemption is allowed if maximum tow times are adhered to) to reduce the bycatch of sea turtles.[8] Research shows that TEDs also allow the escape of larger finfish species.[9]

Vessels harvesting shrimp within Gulf EEZ by trawl may not exceed the recreational reef bag limits. Reef fish may not be sold when taken under a recreational permit/bag limit.[10]

Bycatch data from the Observer Program on the federal otter trawl fleet between 2007 and 2010 indicated that 185 species were observed as incidental catch in the shrimp trawl fishery.[11] Analysis of these data found that the dominant species (5% or greater of total bycatch) were Atlantic croaker, seatrouts, and longspine porgy (combined total approximately 26% of total catch weight). Other species identified were inshore lizardfish, mantis shrimp, portunid crabs, searobins and Gulf butterfish. An assessment of the dominant bycatch species by Raborn et al. (2014) found that shrimp trawl activities did not pose a serious threat to the populations of any of the species analyzed.[12]

Louisiana:

The 'Ecosystem Considerations' section of the Louisiana Shrimp FMP discusses bycatch and discards of the fishery.[13] In addition to the research and results listed above for otter trawls, this section also discusses bycatch in skimmer trawls, used predominantly in state waters. Limited information is available on bycatch in butterfly nets; however, this sector of the fishery is small (only about 3%) and bycatch is fairly consistent with other shrimp trawl methods.

Louisiana does not require the use of BRDs in state waters, as is required in federal waters; therefore, bycatch ratio estimates for otter trawls, provided above, may differ somewhat from otter trawls used in state waters. Additional differences may exist in bycatch composition between inshore and offshore waters. Adkins (1993) conducted bycatch studies on shrimp vessels in Louisiana waters, sampling offshore, inshore, and "wingnet" (butterfly nets) to characterize and compare bycatch ratios of the different areas and gear types.[14] The Adkins study provides bycatch information prior to the widespread use of BRDs. Adkins (1993) found the overall average bycatch ratio to be 3.21:1 and notes that inshore vessels typically had higher bycatch estimates (3.0:1) than offshore vessels (2.2:1), but that bycatch ratios varies significantly by area, time of day, gear type and size of net. Species composition of bycatch, in order of quantity, was bay anchovy (12%), Gulf menhaden (5%), sand seatrout (4%), Atlantic croaker (3.5%), sea catfish (2.3%), blue crab (2.5%), seabobs (1%), and spot (1%). This bycatch composition is generally consistent with early studies cited in the Adkins report. Adkins also notes that no popular commercial or recreational finfish species were present in significant amounts in bycatch, and the common bycatch species found in this study showed no indication of serious impacts from bycatch removals. Since the development of BRDs in the 1990s and federal regulations requiring BRDs in offshore fisheries, many fishermen have also adopted use of these devices within state waters to decrease culling time and increase quality of target catch. Many shrimp fishermen in Louisiana waters now often use BRDs voluntarily, which has potentially

	reduced the overall bycatch ratio in state waters since the Adkins report; however, no recent studies are available to confirm this. Additionally, shrimpers in Louisiana are allowed to retain and sell most bycatch if they are in compliance with regulations for each species.[15] Retained incidental catch is documented through Trip Ticket Program if sold for commercial purposes. Many fishermen also retain bycatch for personal consumption but this practice has not been quantified. Several studies have indicated that bycatch in skimmer trawls (the dominant gear in inshore waters) is substantially lower than bycatch in traditional otter trawls. Hein and Meier (1995) found that the advantages of skimmer trawls, including increased shrimp catch (for white shrimp), less debris and bycatch, lower fuel consumption and easier maneuverability in shallow water all lead to popularization of skimmer use in Louisiana waters.[16] Since the cod end can be retrieved while the net remains in the water fishing, nets are checked and emptied more frequently leading to less bycatch and higher survivability of discards as well as increased quality of retained catch. Early studies of bycatch in skimmer trawls in North Carolina by Coale et al. (1994) comparing skimmer trawls to otter trawls found that skimmers typically caught less bycatch than otter trawls during white shrimp season and bycatch in skimmers had significantly higher survivability rates.[17] More recently, Scott-Denton et al. (2007) conducted skimmer bycatch study using a voluntary observer program on inshore vessels in Louisiana in 2004-2005.[18] Findings indicated that the discards to landings ratio was .63 and main bycatch species consisted of Gulf menhaden (8%), blue crab (7%) and Atlantic croaker (2%). In 2012, a mandatory observer program was implemented for the northern Gulf skimmer fleet in Louisiana, Alabama, and Mississippi. Annual observer reports are published with data on bycatch rates, sea turtle interactions, BRD and TED use, and adherence to tow time restrictions. Bycatch ratios from these reports are: 2012 ratio was 1.24, 2013 ratio was .92, and 2014 1.94.[19,20,21] These reports also document voluntary use of TEDs and BRDs in skimmers and indicate that over 40% of shrimpers are voluntarily using BRDs, and 3-5% are voluntarily using TEDs.	

[1] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[2] Frank Helies and Judy Jamison (2009) "Reduction Rate, Species Composition, and Effort: Assessing Bycatch Within the Gulf of Mexico Shrimp Trawl Fishery." NOAA/NMFS Cooperative Agreement Number NA07NMF4330125 (#101) http://www.gulfsouthfoundation.org/uploads/reports/101_final4.pdf

[3] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[4] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[5] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[6] "Harvesting Systems Unit: Gear Development" NOAA Southeast Fisheries Science Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/fishinggear.htm

[7] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[8] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[9] Scott Raborn, Benny Gallaway, John Cole, William Gazey and Kate Andrews "Effects of Turtle Excluder Devices (TEDs) on the Bycatch of Three Small Coastal Sharks in the Gulf of Mexico Penaeid Shrimp Fishery" 2012. North American Journal of Fisheries Management 32:333-345 http://www.tandfonline.com/doi/abs/10.1080/02755947.2012.678962#preview

[10] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[11] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[12] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[13] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.40. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[14] Gerald Adkins. *A Comprehensive Assessment of Bycatch in the Louisiana Shrimp Fishery.* Technical Bulletin No. 42. Louisiana Department of Wildlife and Fisheries. 1993

[15] Bourgeois et al., 2015. p.40.

[16] Stephen Hein and Paul Meier. "Skimmers: Their Development and Use in Coastal Louisiana." *Marine Fisheries Review 57(1),* 1995 http://spo.nmfs.noaa.gov/mfr571/mfr5712.pdf

[17] J. Stuart Coale, Roger Rulifson, James Murray, and Robert Hines. "Comparisons of Shrimp Catch and Bycatch between a Skimmer Trawl and an Otter Trawl in the North Carolina Inshore Shrimp Fishery." *North American Journal of Fisheries Management* 14:751-768. 1994 https://www.researchgate.net/profile/Roger_Rulifson/publication/254310611_Comparisons_of_Shrimp_Catch_and_Bycatch_between_a_Skimmer_Trawl_and_an_Otter_Trawl_in_the_North_Carolina_Inshore_Shrimp_Fishery/links/5422d5610cf26120b7a60347.pdf

[18] Coale et al., 1994

[19] Pulver, J. R., E. Scott-Denton, and J. A. Williams. "Characterization of the US Gulf of Mexico skimmer trawl fishery based on observer coverage." *NOAA Technical Memorandum NMFS-SEFSC* 636 (2012): 27. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2012_skimmer_trawl_observer_report.pdf

[20] Pulver, Jeffrey R., Elizabeth Scott-Denton, and Jo A. Williams. "Observer coverage of the 2013 Gulf of Mexico skimmer trawl fishery." *NOAA Technical Memorandum NMFS-SEFSC* 654 (2014): 25.http://www.sefsc.noaa.gov/turtles/TM_NMFS_SEFSC_654_Pulver_etal_skimmer.pdf

[21] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

7.6.9(a)(ii) - catch of non-target species (both fish and non-fish species)?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	Several regulations have been designed to minimize catch of non-target species in the shrimp fishery. **Federal:** According to the U.S. Code of Federal Regulations, shrimp trawl vessels must have a certified BRD installed on each net for fishing on their vessel.[1] to be certified by the NOAA Harvesting Systems Unit, a BRD must reduce finfish bycatch by at least 30% by weight.[2] NOAA Harvesting Systems Unit continues to research and certify new BRDs designs in an effort to continually improve bycatch reduction in the shrimp trawl fishery.[3] Furthermore, Amendment 14 of the Shrimp FMP also established a series of seasonal/area closures that can be implemented if an annual assessment of red snapper bycatch indicates that bycatch in the shrimp trawl fishery has exceeded its target limit.[4] TEDs are required on all otter trawls to reduce the bycatch of sea turtles; skimmer trawls are exempt from TED requirements if maximum tow times are adhered to.[5] Research shows that TEDs also allow the escape of larger finfish species, such as sharks.[6] TEDs are 97% effective in allowing for release of turtles, and a compliance rate of 88% for TED use is required by the industry; therefore, some turtle mortality still occurs. TED compliance is currently enforced by NOAA Fisheries enforcement agents, USCG, and each of the five state agency enforcement officers. The 2012 and 2014 biological opinions require an 88% effectiveness rate for TEDs in the Gulf and South Atlantic shrimp trawl fisheries.[7] This rate is calculated using NOAA enforcement and inspection rates and violations are ranked from Level 1 through Level 4 based on severity of violation and likelihood that the offense would lead to a higher turtle capture rate.[8] These compliance data are entered into a matrix to determine the overall effectiveness rate of TEDs in the shrimp trawl fleet on a quarterly basis. NOAA enforcement/inspection data are currently the only source of information on TED compliance used to determine effectiveness for the Gulf shrimp fleet. Though TED enforcement and inspections are conducted by the USCG and each state agency, these data are not made public and not typically included in NOAA's calculations. Many stakeholders believe that measuring TED compliance using only enforcement data biases the calculation negatively because enforcement is not random, rather, enforcement agents tend to target vessels that are more likely to	

be out of compliance. This leads to higher reporting of offenses and a lack of documentation of vessels that are in compliance. In 2015, representatives from each of the enforcement agencies met to further discuss inconsistencies in inspection methods and concerns over methods used to determine TED compliance.[9] State and federal agencies continue to discuss possible solutions to these concerns. TED compliance rates in the past year (April 2014- July 2015) have fluctuated monthly ranging between 76 and 97% compliance rates with an overall average above 90%.[10]

Bycatch data from the Observer Program between 2007 and 2010 indicated that 185 species were observed as incidental catch in the shrimp trawl fishery.[11] Analysis of these data found that the dominant species were Atlantic croaker, sea trout, and longspine porgy (approximately 26% of total catch weight). Other species identified were inshore lizardfish, mantis shrimp, portunid crabs, searobins and Gulf butterfish. An assessment of the dominant bycatch species by Raborn et al. (2014) found that shrimp trawl activities did not pose a serious threat to the populations of any of the species analyzed.[12]

Red snapper *(Lutjanus campechanus)*

Red snapper bycatch has also been a significant concern in the Gulf of Mexico shrimp fishery because the red snapper fishery in the Gulf of Mexico is considered overfished and is in a rebuilding plan.[13] This rebuilding plan includes a significant reduction in juvenile red snapper bycatch in the Gulf of Mexico shrimp fishery. Amendment 9 of the Shrimp FMP deals directly with the reduction of red snapper bycatch.[14] The goal of Amendment 9 was to reduce bycatch of juvenile red snapper in age 0 and age 1 groups by 50%, which was the amount determined by NOAA Fisheries as necessary for the rebuilding plan. Amendment 9 required the use of BRDs in shrimp trawls west of Cape San Blas, FL in the U.S. EEZ. East of Cape San Blas was exempt at the time due to low abundance of red snapper in this area, and state waters were not considered a factor because it was determined that juvenile red snapper typically occur beyond depths of 5 fathoms, and mainly occurred beyond 10 fathoms (80-83% occurrence below 10 fathoms).[15] BRD devices are certified by NOAA Fisheries and BRDs are required in all shrimp trawls except royal red trawls and try nets (nets smaller than 12 ft).[16,17] The implementation of BRD regulations in 1998, and the requirement of TEDs, which also allow for the release of some finfish bycatch, along with the closure seasons/areas in place, and reduction in shrimp effort since the 1990s have all contributed to significant reductions in juvenile red snapper bycatch. In 2007, Amendment 14 (effective in 2008) established a new red snapper bycatch reduction target for the shrimp fishery and designated seasonal closure restrictions that could be used to manage shrimp fishing effort in relation to the target bycatch reduction goal.[18] The seasonal closure area were designated within the statistical zones 10-21 between 10-30 fathoms and designed to start in conjunction with the annual Texas Closure, if needed. The need for the closure, and its duration and extent is determined annually by an SEFSC assessment of the previous year's shrimp effort within the designated zone, and associated red snapper mortality. If it is determined that a seasonal closure is necessary, then the Regional Administrator will set the closed season area and duration as necessary to meet the bycatch reduction target.

Bycatch reduction target for juvenile red snapper in the shrimp fishery have been meet and exceeded through use of BRDs and significant reductions in shrimp effort.[19]

Some stakeholders have also raised concern over other commercially and recreationally important species, such as blacknose shark (*Carcharhinus acronotus*). In 2007, NOAA Fisheries determined that blacknose shark was overfished and experiencing overfishing, and bycatch and associated mortality from the shrimp trawl fishery was considered a factor in the decline of the species.[20] Since this time, the blacknose shark population has been divided into two separate populations- an Atlantic population and a Gulf of Mexico population.[21] The Atlantic population remains listed as overfished and overfishing; however, the Gulf of Mexico stock is currently considered unknown based on the 2011 NOAA Fisheries stock assessment.[22] Raborn et al. (2012) determine that implementation of TEDs was effective in mitigating bycatch of blacknose sharks in the gulf of Mexico shrimp fishery since sharks are also capable of escaping trawls through TEDs.[23]

Louisiana:

Louisiana does not require BRDs in state waters; however, many fishermen use them voluntarily in certain seasons/areas to reduce incidental catch.[24] Adkins (1993) conducted bycatch studies on shrimp vessels in Louisiana waters, sampling offshore, inshore, and "wingnet" (butterfly nets) to characterize and compare bycatch ratios of the different areas and gear types.[25] The Adkins study provides bycatch information prior to the widespread use of BRDs. Adkins (1993) found the overall average bycatch ratio to be 3.21:1 and notes that inshore vessels typically had higher bycatch estimates (3.0:1) than offshore vessels (2.2:1), but that bycatch ratios varies significantly by area, time of day, gear type and size of net. Species composition of bycatch, in order of quantity, was bay anchovy (12%), Gulf menhaden (5%), sand seatrout (4%), Atlantic croaker (3.5%), sea catfish (2.3%), blue crab (2.5%), seabobs (1%), and spot (1%). This composition is generally consistent with early studies cited in the Adkins report, and more recent studies such as Scott-Denton et al. (2012). Adkins also notes that no popular commercial or recreational finfish species were present in significant amounts in bycatch, and the common bycatch species found in this study showed no indication of serious impacts from bycatch removals. Since the development of BRDs in the 1990s and federal regulations requiring BRDs in offshore fisheries, many fishermen have also adopted use of these devices within state waters to decrease culling time and increase quality of target catch. Many shrimp fishermen in Louisiana waters now often use BRDs voluntarily, which has potentially reduced the overall bycatch ratio in state waters since the Adkins report; however, no recent studies are available to confirm this. Additionally, shrimpers in Louisiana are allowed to retain and sell most bycatch if they are in compliance with regulations for each species.[26] Retained incidental catch is documented through Trip Ticket Program if sold for commercial purposes. Many fishermen also retain bycatch for personal consumption but this practice has not been quantified.

Several studies have indicated that bycatch in skimmer trawls (the dominant gear in inshore waters) is substantially lower than bycatch in traditional otter trawls. Hein and Meier (1995) found that the advantages of skimmer trawls, including increased shrimp catch (for white shrimp), less debris and bycatch, lower fuel consumption and easier

	maneuverability in shallow water all lead to popularization of skimmer use in Louisiana waters.[27] Since the cod end can be retrieved while the net remains in the water fishing, nets are checked and emptied more frequently leading to less bycatch and higher survivability of discards as well as increased quality of retained catch. Early studies of bycatch in skimmer trawls in North Carolina by Coale et al. (1994) comparing skimmer trawls to otter trawls found that skimmers typically caught less bycatch than otter trawls during white shrimp season and bycatch in skimmers had significantly higher survivability rates.[28] More recently, Scott-Denton et al. (2007) conducted skimmer bycatch study using a voluntary observer program on inshore vessels in Louisiana in 2004-2005.[29] Findings indicated that the discards to landings ratio was .63 and main bycatch species consisted of Gulf menhaden (8%), blue crab (7%) and Atlantic croaker (2%). In 2012, a mandatory observer program was implemented for the northern Gulf skimmer fleet in Louisiana, Alabama, and Mississippi. Annual observer reports are published with data on bycatch rates, sea turtle interactions, BRD and TED use, and adherence to tow time restrictions. Bycatch ratios from these reports are: 2012 ratio was 1.24, 2013 ratio was .92, and 2014 1.94.[30,31,32] These reports also document voluntary use of TEDs and BRDs in skimmers and indicate that over 40% of shrimpers are voluntarily using BRDs, and 3-5% are voluntarily using TEDs.	

[1] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[2] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[3] "Harvesting Systems Unit: Gear Development" NOAA Southeast Fisheries Science Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/fishinggear.htm

[4] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[5] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[6] Scott Raborn, Benny Gallaway, John Cole, William Gazey and Kate Andrews "Effects of Turtle Excluder Devices (TEDs) on the Bycatch of Three Small Coastal Sharks in the Gulf of Mexico Penaeid Shrimp Fishery" 2012. North American Journal of Fisheries Management 32:333-345 http://www.tandfonline.com/doi/abs/10.1080/02755947.2012.678962#preview

[7] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[8] NOAA Fisheries. "Penalty Matrix for Endangered Species Act" *NOAA Policy for Assessment of Penalties and Permit Sanctions*. March 2011. http://www.shrimpalliance.com/new//wp-content/uploads/2012/03/2pagesfromPenaltyPolicy.pdf

[9] Gulf and South Atlantic Fisheries Foundation. "Gulf and South Atlantic News, Volume 16, Issue 1" May 2014 http://gulfsouth.ehclients.com/uploads/newsletters/5_15newsletter_short.pdf

[10] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[11] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[12] Raborn et al., 2014.

[13] "Red Snapper" *Fishwatch*. Web. Accessed June 2015. http://www.fishwatch.gov/seafood_profiles/species/snapper/species_pages/red_snapper.htm

[14] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[15] Nichols, Scott. *The spatial and temporal distribution of the bycatch of red snapper by the shrimp fishery in the offshore waters of the US Gulf of Mexico*. Pascagoula, Mississippi: National Marine Fisheries Service, Mississippi Laboratories, 1990.

[16] "BRD Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/brd/designs.htm

[17] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[18] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[19] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[20] SEDAR 13. "Stock Assessment Report- Small Coastal Shark Complex, Atlantic Sharpnose, Blacknose, Bonnethead, and Finetooth Shark" Southeast Data, Assessment, and Review. 2007. http://www.nmfs.noaa.gov/sfa/hms/species/sharks/documents/shark_stock_assessment_report_11-14-07.pdf

[21] SEDAR 21. "HMS Gulf of Mexico Blacknose Shark Stock Assessment Summary report" Southeast Data, Assessment, and Review. 2011. http://www.nmfs.noaa.gov/sfa/hms/species/sharks/documents/gulf_of_mexico_blacknose_shark_assessment_summary_final.pdf

[22] NOAA Fisheries. *Status of Stocks 2014, Annual Report to Congress on the status of U.S. Fisheries.* http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2014/2014_status_of_stocks_final_web.pdf

[23] Scott Raborn, Benny Gallaway, John Cole, William Gazey and Kate Andrews "Effects of Turtle Excluder Devices (TEDs) on the Bycatch of Three Small Coastal Sharks in the Gulf of Mexico Penaeid Shrimp Fishery" 2012. North American Journal of Fisheries Management 32:333-345 http://www.tandfonline.com/doi/abs/10.1080/02755947.2012.678962#preview

[24] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.40. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[25] Gerald Adkins. *A Comprehensive Assessment of Bycatch in the Louisiana Shrimp Fishery.* Technical Bulletin No. 42. Louisiana Department of Wildlife and Fisheries. 1993

[26] Bourgeois et al., 2015. p.40.

[27] Stephen Hein and Paul Meier. "Skimmers: Their Development and Use in Coastal Louisiana." *Marine Fisheries Review 57(1),* 1995 http://spo.nmfs.noaa.gov/mfr571/mfr5712.pdf

[28] J. Stuart Coale, Roger Rulifson, James Murray, and Robert Hines. "Comparisons of Shrimp Catch and Bycatch between a Skimmer Trawl and an Otter Trawl in the North Carolina Inshore Shrimp Fishery." *North American Journal of Fisheries Management* 14:751-768. 1994 https://www.researchgate.net/profile/Roger_Rulifson/publication/254310611_Comparisons_of_Shrimp_Catch_and_Bycatch_between_a_Skimmer_Trawl_and_an_Otter_Trawl_in_the_North_Carolina_Inshore_Shrimp_Fishery/links/5422d5610cf26120b7a60347.pdf

[29] Coale et al., 1994

[30] Pulver, J. R., E. Scott-Denton, and J. A. Williams. "Characterization of the US Gulf of Mexico skimmer trawl fishery based on observer coverage." *NOAA Technical Memorandum NMFS-SEFSC* 636 (2012): 27. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2012_skimmer_trawl_observer_report.pdf

[31] Pulver, Jeffrey R., Elizabeth Scott-Denton, and Jo A. Williams. "Observer coverage of the 2013 Gulf of Mexico skimmer trawl fishery." *NOAA Technical Memorandum NMFS-SEFSC* 654 (2014): 25.http://www.sefsc.noaa.gov/turtles/TM_NMFS_SEFSC_654_Pulver_etal_skimmer.pdf

[32] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

7.6.9(a)(iii) - impacts on associated, dependent or endangered species?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	Endangered Species Bycatch: One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the ESA, which includes five species of sea turtles, smalltooth sawfish, and Gulf sturgeon.[1] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. NOAA Office of Protected Resources provides detailed information on each species on their website, with each species site containing details on species status, description, habitat, distribution, population trends, threats, regulatory history and conservation efforts.[2]	

Sea Turtle Bycatch:

Five species of sea turtles are known to inhabit areas with shrimp trawls in the Gulf of Mexico: Hawksbill (*Eretmochelys imbricate*), Kemp's ridley (*Lepidochelys kempii*), Leatherback(*Dermochelys coriacea*), Green (*Chelonia mydas*), and Loggerhead (*Caretta caretta*). Of the five species, the Kemp's ridleys are of most concern in the Gulf of Mexico due to their limited range, which is primarily within the Gulf. The other four species of sea turtles are found worldwide. Sea turtles do not typically nest along the Louisiana coast and primarily utilize Louisiana waters for foraging.[3]

A National Research Council (NRC) report published in 1990 determined that shrimp trawl bycatch was one of the most significant sources of mortality causing declines in sea turtle populations.[4] Research on TEDs began in the late 1970s, and in 1981 a voluntary program was initiated to encourage fishermen to utilize TEDs in shrimp trawls. Early TED designs were cumbersome and difficult to use and did not gain favor with most fishermen; therefore, TED use was low throughout the 1980s.[5] Federal legislation was passed in 1987 and went into effect in 1989 requiring widespread use of TEDs in shrimp trawls and by 1990 most shrimp trawls were equipped with TEDs. In 1993 a modification was made to allow for increased escape of leatherback turtles and in 2003, and additional modification in regulations to require larger opening further increased escape rates for larger loggerheads and leatherbacks. The 2003 regulation change was expected to reduce mortality of loggerheads by 94% and leatherbacks by 97%. Certified TED designs are required to meet a minimum efficiency threshold of 97% escapement of turtles within a five minute time period. TEDs have been very effective at reducing sea turtle shrimp trawl mortality as summarized by Finkbeiner et al. (2011):[6]

Species	Mortality	
Atlantic/Gulf	Pre-regulation	Post-Regulation
Lepidochelys kempii	4,300	2,700
Caretta caretta	63,500	1,400
Chelonia mydas	500	300
Dermochelys coriacea	2,300	40
Ertmochelys imbricata	20	<10
	70,620	4,450

Post-TED mortality estimates are about 94% lower, (4,450 total deaths) than pre-regulation estimates (70,620). Mandatory TED requirements are currently in place for otter trawls in the shrimp fishery in both state and federal waters (federal jurisdiction of protected species extends into state waters).

NOAA and USFWS are jointly responsible for sea turtle conservation under the ESA and are required to consult on all activities that may impact the recovery of each species. Through this consultation process, NOAA has produced several Biological Opinions pertaining to sea turtle conservation and continued authorization of the Gulf of Mexico shrimp fishery. Each Biological Opinion produced by NOAA has authorized the continued operation of the shrimp fishery and includes an Incidental Take Statement. The 2012 Biological Opinion established

requirements for enforcement and compliance with TED use in shrimp trawls and set a 'sea turtle capture rate standard' that limits the fishery to a 12 % sea turtle capture rate.[7] The 2014 Biological Opinion maintains this standard (88% effectiveness) in the Incidental Take Statement as a procedure for determining if impacts of the action (continued operation of the shrimp trawl fishery) exceed the expected authorized take. If an Incidental Take Statement is exceeded, a new Biological Opinion is initiated. Compliance rates are actively monitored and a minimum 88% rate with TED use must be maintained otherwise NOAA Fisheries is required to take action, which could include closure of the fishery.[8] NOAA Fisheries posts compliance data on their website and current data indicate that the Gulf of Mexico shrimp fleet (including Louisiana) is in compliance with TED requirements.[9]

The 2014 Biological Opinion notes in the Incidental Take section (page 231) that current data does not allow for reliable estimates of sea turtle take from fishery interactions. The authors note that the last physical observations documenting fishery interactions, which were from "naked nets" (nets without TEDs) in the 1990s, which is not representative of the current fishery. Several assumptions and biases also exist in previous studies to overcome data gaps at the time and these studies are now over 15 years old. Updating survey data to gather the information necessary to make reliable estimates of sea turtle take is considered to be too cost prohibitive; therefore, jeopardy analyses are based on existing knowledge and effort and compliance data from the fishery.[10] The Louisiana Shrimp FMP notes that data needed for accurate assessments of most sea turtle populations are not available and prevents meaningful evaluations that can benefit management.[11] NOAA Fisheries requested input from NRC on methods for improving sea turtle population assessments and in 2010 NRC published a report on sea turtle status and trends. The overarching conclusion was that several serious demographic data gaps exist precluding accurate assessment and strongly recommends that NOAA and USFWS develop a coherent national strategy for sea turtle assessment to improve data collection methods, data quality, and data availability meets standards of external review. Appendix VII of the Louisiana Shrimp FMP provides the detailed conclusions and recommendations of the NRC report.[12]

When federal TED regulations initially passed in 1987, the Louisiana state legislature passed a law preventing LDWF enforcement agents from enforcing TED requirements; however, these requirements have consistently been enforced by NOAA Fisheries and USCG in Louisiana waters since implementation of the regulation. The Louisiana Shrimp FMP, Appendix V provides NOAA and USCG TED compliance reports by state, showing that Louisiana is actively monitored and in compliance with TED regulations.[13] In 2015, the Louisiana law preventing TED enforcement was repealed and LDWF agents are now authorized to enforce all federal TED and BRD requirements.

Currently, TED compliance is enforced by NOAA Fisheries enforcement agents, USCG, and each of the five state agency enforcement officers. The effectiveness rate required by the Biological Opinion is calculated using NOAA enforcement and inspection rates. Violations are ranked from Level 1 through Level 4 based on

severity of violation and likelihood that the offense would lead to a higher turtle capture rate.[14] These compliance data are entered into a matrix to determine the overall effectiveness rate of TEDs in the shrimp trawl fleet. NOAA enforcement/inspection data are currently the main source of information on TED compliance used to determine effectiveness for the Gulf shrimp fleet. Though TED enforcement and inspections are conducted by the USCG and each state agency, these data are not made public and not necessarily included in NOAA's calculations. Many stakeholders believe that measuring TED compliance using only enforcement data biases the calculation negatively because enforcement is not random, rather, enforcement agents tend to target vessels that are more likely to be out of compliance. This leads to higher reporting of offenses and a lack of documentation of vessels that are in compliance. In 2015, representatives from each of the enforcement agencies met to further discuss inconsistencies in inspection methods and concerns over methods used to determine TED compliance.[15] State and federal agencies continue to discuss possible solutions to these concerns. NOAA enforcement and inspection rates for the shrimp fishery are low due to a limited number of enforcement agents and few members of the NOAA Gear Monitoring Team (GMT) capable of conducting inspections. In 2015, the federal fishery has over 1300 permits and the number of state licenses range from 300-1000+ permits. NOAA inspections cover about 200 vessels per year.[16] Compliance rates are calculated by quarter, and small sample sizes in some months can lead to biases the overall compliance percentages. The inclusion of USCG and state agency enforcement data could improve the sample size and reduce bias in these calculations.

Compliance rates have fluctuated for the past several years and maintaining high TED compliance and effectiveness rates for the fishery requires ongoing efforts. A particular period of concern occurred from March to November 2011, when the TED compliance rate was as low as 66%, with an effectiveness rate ranging between 83-85%.[17] It should be noted that investigation into TED compliance during this time found that the majority of violations were from newly installed TEDs that were not properly installed by net shops. NOAA was able to trace the TEDs back to specific net shops to rectify the problem and the TEDs were corrected prior to the opening of shrimp season; therefore, though compliance rates appear low for this time period, the actual risk to sea turtle populations was avoided.[18] Since 2011, education, outreach, and increased courtesy inspections by NOAA GMT and Sea Grant have helped to increase compliance ratings and NOAA now posts compliance numbers quarterly on their website.[19]

Regulations for TEDs in skimmer trawls and butterfly nets differ from otter trawls. Currently, regulations for skimmer trawls and butterfly nets require either a TED installed in each net, or adherence to maximum tow times (maximum 55 minutes from April 1 to October 31, and 75 minutes from November 1 to March 31).[20] Skimmer trawls and butterfly nets, because of their design, are checked with much higher frequency than otter trawls which greatly reduces the risk of a sea turtle drowning within a net, and tow time regulations are set based on the biological information regarding the length of time sea turtles can remain submerged.

Increased turtle strandings in the Gulf of Mexico in 2010-11 prompted observer coverage and further study of turtle bycatch in skimmers. Observer coverage on the skimmer fleet from 2012 through 2014 indicates that over 60% of tows throughout the 3 years of study have exceeded tow time limits, and low compliance with tow time regulations has raised concerns by stakeholders.[21,22,23] These reports prompted NOAA to take action in 2 ways- 1) increase tow time awareness and education efforts, and 2) research effective TED designed for mandatory use in skimmers. Data from the 2012 observer coverage indicated that the standard 4" TED design currently in use on otter trawls was not able to exclude smaller sized turtles typically found in nearshore areas where skimmers are used. NOAA is currently researching TED designs and will likely propose a mandatory TED rule for skimmers in the future. Currently, adhering to tow time restrictions is the most effective way to prevent turtle mortalities in skimmer nets. The Louisiana Shrimp FMP also notes that may fishermen have argued that they do not encounter sea turtles in certain areas of Louisiana waters and that TED use in these areas causes significant shrimp loss due to high amounts of woody debris from river discharge that blocks TEDs.[24] Sea turtle distribution data are lacking, and LDWF is currently working to develop sea turtle monitoring in state waters to better understand sea turtle activity in state waters and potential interactions with the inshore shrimp fleet. Recent funding was awarded to LDWF by NFWF for sea turtle monitoring and surveys will begin in Spring 2016.

In addition to efforts to reduce sea turtle mortality, NOAA Fisheries, USFWS, GSMFC, state agencies and shrimp industry groups have contributed to efforts to protect sea turtle nesting beaches in Mexico and areas throughout the Gulf coast to assist in the recovery of sea turtle populations.[25] NOAA SEFSC Galveston Lab participates in 1) Captive Rearing Program, which provides opportunities to research numerous aspects of sea turtles, 2) Gear Research Program, and 3) the Sea Turtle Stranding and Salvage Program.[26]

Smalltooth sawfish (*Pristis pectinata*)

The Recovery Plan for smalltooth sawfish cites bycatch in fisheries (including the shrimp fishery) as a primary reason for the decline of this species.[27] Previous documentation of landings as incidental catch in the shrimp fishery were reported between 1940s-1980s in Louisiana and Texas; however, there has been minimum documentation of recent landings and informal interviews by port agents indicate that recent interactions are rare. The population of smalltooh sawfish is thought to have declined by as much as 95% and the geographical range of the species is likely significantly diminished. Currently, three NWRs in Florida provide habitat protection for known reproducing populations of smalltooth sawfish, catch or harm of smalltooth sawfish is illegal, and guidelines have been published on the handling and release of smalltooth sawfish that are incidentally caught in commercial and recreational fisheries. The recovery Plan estimates for one smalltooth sawfish taken in the shrimp trawl fishery per year. It is possible that the implementation of TEDs and BRDs in the shrimp fishery would allow for smalltooth sawfish escape should interactions with shrimp trawls occur. There is still some question; however, as to whether trawl bycatch might impact recovery if/when this species population begins

	to rebuild and potential interactions increase. Gulf Sturgeon (*Acipenser oxyrinchus desotoi*) The most recent 5-year review (2009) for the Recovery Plan for Gulf Sturgeon notes that bycatch in shrimp trawls has been infrequently documented in past and that implementation of TED and BRD regulations has likely mitigated bycatch impacts to this species.[28] No regulatory actions are required directly in relation to bycatch of Gulf sturgeon for the shrimp fishery. **Marine Mammal Bycatch:** The MMPA 1994 revision includes changes of regulation regarding the incidental take of marine mammals in commercial fishing operations, requiring a goal to reduce serious injury and mortality of marine mammals to "insignificant levels", approaching a zero mortality rate. "Insignificant Level" is defined as less than 10% of the potential biological removal (PBR).[29] NOAA's Office of Protected Species evaluates fisheries based on their potential interaction with marine mammals during fishing operations and places fisheries into three categories: Cat. I- high interaction, Cat. II- med-low interaction, and Cat. III- little or no known interactions.[30] The Gulf of Mexico shrimp fishery is currently listed as a Category II fishery on the List of Fisheries.[31] This determination was based on potential interactions with bottlenose dolphins. Lack of a calculated PBR for the Gulf of Mexico bottlenose dolphin populations, data from stranding programs, and low observer coverage in the fishery are all reasoned that prompted NOAA to assign a Cat. II ranking. Cat. II designation requires that each fishery participant be registered with the Office of Protected species and carry an authorization certificate. Typically, registration with the Marine Mammal Authorization Program is combined with state and federal permitting systems and all fishermen receiving permits are registered with the Office of Protected Species automatically. Cat. II requirements also require the fishery to have an observer program and fishermen must carry an observer onboard if requested, and must comply with any take reduction plans in place. There is currently no take reduction plan in the Gulf of Mexico for bottlenose dolphins. Fishermen are also required to report all incidental injuries and mortalities of marine mammals to the Office of Protected Species.	

[1] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[2] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[3] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.42. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[4] National Research Council (US). Committee on Sea Turtle Conservation. *Decline of the sea turtles: causes and prevention*. National Academies Press, 1990.

[5] "History of Turtle Excluder Devices (TEDs)" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/history.htm

[6] Elena M. Finkbeiner, Bryan P. Wallace, Jeffrey E. Moore, Rebecca L. Lewison, Larry B. Crowder, and Andrew J. Read, "Cumulative estimates of sea turtle bycatch and mortality in USA fisheries between 1990 and 2007" Biological Conservation 144 (2011) 2719–2727 http://micheli.stanford.edu/pdf/Cumulative%20estimates%20of%20sea%20turtle%20bycatch%20and%20mortality%20in%20U.S.A.%20fisheries%20between%201990-2007.pdf

[7] NMFS. 2012. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/fisheries_bo/southeastshrimpbiop_final.pdf

[8] NOAA Fisheries. *Turtle Excluder Device (TED) Compliance Policy*. Draft May 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/ted_compliance_policy.pdf

[9] "TED compliance" *NOAA Fisheries*. Web. Accessed June 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/index.html

[10] NMFS. 2014.

[11] Bourgeois et al., 2015. p.48.

[12] Bourgeois et al., 2015. p.108-113.

[13] Bourgeois et al., 2015. p.104-105.

[14] NOAA Fisheries. "Penalty Matrix for Endangered Species Act" *NOAA Policy for Assessment of Penalties and Permit Sanctions*. March 2011. http://www.shrimpalliance.com/new//wp-content/uploads/2012/03/2pagesfromPenaltyPolicy.pdf

[15] Gulf and South Atlantic Fisheries Foundation, "Gulf and South Atlantic News, Volume 16, Issue 1" May 2014 http://gulfsouth.ehclients.com/uploads/newsletters/5_15newsletter_short.pdf

[16] NOAA Fisheries. *Turtle Excluder Device (TED) Compliance Policy*. Draft May 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/ted_compliance_policy.pdf

[17] NMFS. 2014.

[18] Bourgeois et al., 2015. p.44.

[19] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[20] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[21] Pulver, J. R., E. Scott-Denton, and J. A. Williams. "Characterization of the US Gulf of Mexico skimmer trawl fishery based on observer coverage." *NOAA Technical Memorandum NMFS-SEFSC* 636 (2012): 27. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2012_skimmer_trawl_observer_report.pdf

[22] Pulver, Jeffrey R., Elizabeth Scott-Denton, and Jo A. Williams. "Observer coverage of the 2013 Gulf of Mexico skimmer trawl fishery." *NOAA Technical Memorandum NMFS-SEFSC* 654 (2014): 25.http://www.sefsc.noaa.gov/turtles/TM_NMFS_SEFSC_654_Pulver_etal_skimmer.pdf

[23] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[24] Bourgeois et al., 2015. p.66.

[25] Bourgeois et al., 2015. p.47.

[26] "Sea turtles" *NOAA Galveston Laboratory.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/seaturtles/index.html

[27] National Marine Fishery Service (NMFS). 2010. *Smalltooth Sawfish 5-Year Review: Summary and Evaluation.* http://www.nmfs.noaa.gov/pr/pdfs/species/smalltoothsawfish_5yearreview.pdf

[28] USFWS and NMFS. 2009. *Gulf Sturgeon (Acipenser oxyrinchus desotoi) 5-Year Review*. http://www.nmfs.noaa.gov/pr/pdfs/species/gulfsturgeon_5yearreview.pdf

[29] "Marine Mammal Protection Act" *NOAA Fisheries*. Web. Accessed August 2015. http://www.nmfs.noaa.gov/pr/laws/mmpa/

[30] "List of Fisheries" *NOAA Fisheries Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/interactions/lof/#report

[31] NOAA Office of Protected Species. "U.S. Atlantic, Gulf of Mexico Shrimp Trawl Fishery" http://www.nmfs.noaa.gov/pr/pdfs/fisheries/lof2012/southeastern_us_atlantic_gulf_shrimp_trawl.pdf

7.6.9 (b) Are technical measures being taken in relation to:

(i) - fish size? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: White shrimp harvested in Gulf waters are subject to size requirements of the state of Louisiana when possessed within Louisiana waters and landed in Louisiana ports. According to the U.S. Code of Federal Regulations (CFR), shrimp not in compliance with applicable size limits may not be possessed, sold, or purchased and must be released immediately. The CFR holds the operator of the vessel fishing in the Gulf EEZ responsible for compliance of the size limits specified.[1] **Louisiana:** Size limits for shrimp in Louisiana vary by species and season. From the Louisiana		

Shrimp FMP:[2] 'There is no size limit for any shrimp harvested during the spring open season nor for brown or seabob shrimp harvested during any open season. White shrimp is legal size when a pound of white shrimp equals 100 whole shrimp or less. Fishermen may not harvest sub-legal white shrimp, except from October 15 through the 3rd Monday in December. Also, when more than half of a fisherman's catch is seabobs or brown shrimp, no more than 10 percent (by weight) of the catch may be sub-legal size white shrimp.'		

[1] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_156

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.59 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.6.9 (b)(ii) - mesh size or gear? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: According to the U.S. Code of Federal Regulations, explosives, chemicals and plants, fish traps, bottom trawls without a weak link in the tickler chain, and use of Gulf reef fish as bait are all prohibited in the EEZ.[1] In the Gulf EEZ, traps may not be used to fish for royal red shrimp.[2] Allowable gear for the Gulf of Mexico shrimp fleet are otter trawl, butterfly net, skimmer trawl, and cast net.[3] Shrimp trawls in the EEZ are required to have weak links in the tickler chain and must be equipped with a certified BRD.[4] All shrimp otter trawls in state and federal waters are required to be equipped with a certified TED, and skimmer trawls in state and federal waters are required to have a TED or adhere to maximum tow times.[5] **Louisiana:** Louisiana regulations specify the size and configuration of legal trawls, skimmer nets and butterfly nets.[6] Restrictions on mesh size are used to regulate the size of shrimp harvested, and net size restrictions control harvest levels and reduce user conflicts. Gear regulations in state waters:[7] - Mesh size (otter trawl, butterfly and skimmer nets) must be at least 5/8 inch bar or 1 ¼ inches stretched mesh. Must be at least 3/4-inch bar or 1-1/2 inches stretched mesh during the fall inshore shrimp season from the western shore of Vermilion Bay and Southwest Pass at Marsh Island to the Atchafalaya River - Regulations on size and number of nets vary based on location (see Louisiana Commercial Fishing Regulations guide for details). - Otter trawls: Inshore waters- either 1 net measuring 50 feet or less or two nets measuring 25 feet or less each.		

- Butterfly nets: a single stationary net may measure no more than 22 feet vertically or horizontally. Double butterfly nets may measure no more than 12 feet vertically or horizontally per net if stationary, or 12 feet vertically and 16 feet horizontally if on a vessel. - Skimmer nets: double skimmer nets may have an opening circumference of no more than 72 feet for each net.		

[1] 50 C.F.R. § 622.9 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_19

[2] 50 C.F.R. § 622.54 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_154

[3] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[4] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#_top

[5] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[6] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.59 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[7] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

7.6.9 (b)(iii) - discards? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: According to the U.S. Code of Federal Regulations, shrimp trawl vessels must have a certified BRD installed on each net for fishing on their vessel to reduce finfish bycatch.[1] Certified BRDs must be designed to reduce finfish bycatch by a minimum of 30%. Turtle exclusion devices (TEDs) are also required on all otter trawls and in skimmer trawls (exemption is allowed if maximum tow times are adhered to) to reduce the bycatch of sea turtles.[2] Vessels harvesting shrimp within Gulf EEZ by trawl may not exceed the recreational reef bag limits. Reef fish may not be sold when taken under a recreational permit/bag limit.[3] **Louisiana:** Licensed shrimpers in Louisiana may retain and sell bycatch species provided they are in compliance with appropriate regulations and may retain bycatch for personal consumption as long as it is within recreational size and daily possession limits.[4] These regulations were designed to reduce discards and many fishermen do retain non-target species for both commercial sale and personal use.		

[1] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-

idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[2] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[3] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.66 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.6.9 (b)(iv) - closed seasons? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: According to the U.S. Code of Federal Regulations, there are numerous closed areas at varying times throughout the Gulf EEZ. Shrimp sanctuaries are also in place in Gulf waters (which prohibit shrimping within their boundaries) to protect marine resources. Each year, a seasonal area closure for the shrimp fishery may be established to reduce juvenile red snapper mortality based on the framework procedure in the Gulf Shrimp FMP. Determining the need for closures and the geographical extent and duration is based on an annual assessment (from the SEFSC) of shrimp effort and shrimp trawl bycatch mortality.[1] NOAA Fisheries closes federal waters to shrimping off the coast of Texas from approximately mid-May to mid-July (based on sampling conducted by the Texas Parks and Wildlife Department). Federal waters open to shrimp fishing when Texas opens state waters.[2] **Louisiana:** Commercial shrimpers may only harvest during open shrimp seasons (unless in possession of a Special Bait Dealers Permit to harvest live bait shrimp). Shrimp seasons are set by LWFC by area based on biological sampling, environmental conditions, and industry input during public hearings.[3] In general, inside waters have a spring season (May to July) and a fall season (August to December); outside waters are year round with some area closures from late December through April/May to protect small white shrimp. LWFC also has the authority to close waters when deemed necessary.		

[1] 50 C.F.R. § 622.55 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_155

[2] *FishWatch*. Web. Accessed November 2015. http://www.fishwatch.gov/seafood_profiles/species/shrimp/species_pages/brown_shrimp.htm

[3] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 59. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.6.9 (b)(v) - closed areas? ***Yes...***[1] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Each year, a seasonal area closure for the shrimp fishery may be established based on the framework procedure in the Gulf Shrimp Fisheries Management Plan (FMP). The need for closures and the geographical scope and duration is based on an annual assessment conducted by the SEFSC shrimp effort and shrimp trawl bycatch mortality.[1] Due to fishing complications with the stone crab industry, five zones have been established in the Gulf EEZ to separate shrimp trawling and stone crab trapping.[2] Shrimp sanctuaries are also in place in Gulf waters (which prohibit shrimping within their boundaries) to protect marine resources.[3] **Louisiana:** Louisiana regulates the areas that shrimp trawling may occur based on gear type and some areas, including wildlife refuges, WMAs, and habitat conservation areas, are closed to commercial shrimping activities.[4] For a detailed description of area restrictions and closures see the current commercial shrimp regulations on the LDWF website (http://www.wlf.louisiana.gov/fishing/shrimp-1.)		

[1] 50 C.F.R. § 622 http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[2] 50 C.F.R. § 622.55 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_155

[3] 50 C.F.R. § 622.55 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_155

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 59. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.6.9 (b)(vi) - areas reserved for particular (e.g. artisanal) fisheries? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: There no designated areas within federal waters designed for a specific user group for shrimp. Recreational and live-bait shrimping are regulated within various state waters in the Gulf; however, these activities do not typically occur in federal waters due to distance from shore. **Louisiana:** Recreational shrimping in Louisiana is allowed within the same areas and seasons as commercial shrimping.[1,2] Live bait shrimping is allowed year round under strict harvest limitations and must carry an approved vessel monitoring system (VMS).[3]		

[1] "Recreational Shrimp Regulations" *Fish Louisiana*. Web. Accessed Nov. 2015. http://www.fishla.org/fishing/recreational-fishing-regulations/recreational-shrimping/

[2] "Shrimp Regulations" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/fishing/shrimp-1

[3] "Live Bait Shrimp" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/fishing/live-bait-shrimp

7.6.9 (b)(vii) - protection of juveniles or spawners? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: Due to high reproductive rates and short life cycles, shrimp stocks are highly resilient to fishing pressures, and management focus is largely on economic improvements and minimizing bycatch, rather than abundance. Therefore, the goal of shrimp size restrictions, while protecting juveniles, is meant to maximize the harvest (while minimizing its environmental impact). Seasons are set according to results of biological sampling providing information on life cycle and abundance to ensure the shrimp harvested are a marketable size and that enough mature shrimp survive to reproduce and sustain the fishery.[1] According to the U.S. Code of Federal Regulations, shrimp not in compliance with applicable size limits may not be possessed, sold, or purchased and must be released immediately. The U.S. Code of Federal Regulations holds the operator of the vessel fishing in the Gulf EEZ responsible for compliance of the size limit regulations.[2] **Louisiana:** Louisiana shrimp seasons are opened once shrimp reach marketable size based on biological sampling conducted by LDWF. Additionally, area closures occur between December and April/May for the protection of small, overwintering white shrimp in offshore waters.[3]		

[1] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Species?SpeciesID=99

[2] 50 C.F.R. § 622.56 http://www.ecfr.gov/cgi-bin/text-idx?SID=c1452f0a1551a55a4307efe4c53b57ee&mc=true&node=pt50.12.622&rgn=div5#se50.12.622_156

[3] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 19. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.6.9 (c) Are suitable arrangements in place to promote, to the extent practicable, the development and use of selective, environmentally safe and cost-effective gear and techniques? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	The primary gear types in the Louisiana commercial shrimp fishery are otter trawls,	

	skimmer trawls, and butterfly nets; there is occasional use of cast nets, but documentation of catch with this gear is very small and chopstick nets were banned in both inshore and offshore waters in Louisiana in 1984.[1,2] Fishermen and managers in the Gulf Of Mexico work collaboratively on innovative gear modifications to reduce impacts. TEDs are required in otter trawls in state and federal waters by federal regulations, and tow time limits are required for skimmer trawls and butterfly nets.[3] The use of BRDs is required in federal waters and encouraged in state waters, but not required.[4] Substantial improvements have been made in reducing impacts of shrimp fishing, however, the Gulf of Mexico shrimp fishery still has one of the highest bycatch ratios among U.S. Fisheries.[5] Continuing efforts to improve gear designs are ongoing. For specific details on gear selectivity of the Louisiana shrimp trawl fishery, refer to 7.2.2 (g)(iii) response.	

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. page 23. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[3] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[4] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[5] National Marine Fisheries Service. 2013. *U.S. National Bycatch Report First Edition Update 1* [L. R. Benaka, C. Rilling, E. E. Seney, and H. Winarsoo, Editors]. U.S. Dep. Commerce. http://www.st.nmfs.noaa.gov/Assets/Observer-Program/bycatch-report/NBR_FirstEditionUpdate1.pdf

7.6.10 Have measures been introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery of such stocks?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Gulf of Mexico shrimp fishery is managed by the GMFMC and NOAA Fisheries under the principles of the MSA. The GMFMC Shrimp FMP is in compliance with MSA mandates to prevent overfishing and overfished conditions.[1] The GMFMC originally established an overfishing and overfished levels for each of the penaeid species in Amendment 13 of the Shrimp FMP.[2] NOAA Fisheries has monitored the parent stock levels for all three shrimp species since 1970. Parent stock levels for these species have remained above the established thresholds throughout the monitoring period and all three stocks are not considered overfished or undergoing overfishing. Recent changes in the model used for annual stock assessments for the Gulf of Mexico penaeid shrimp species now produce different outputs and in 2015		

GMFMC updated the SDC for penaeid shrimp to fit with this new model.[3]
The new reference points are:

MSY

- Brown shrimp: MSY is 146,923,100 pounds of tails
- White shrimp: MSY is 89,436,907 pounds of tails

Overfishing

The overfishing threshold is defined as the MFMT. The MFMT for each penaeid shrimp stock is defined as the fishing mortality rate at MSY (F_{MSY}).

- Brown shrimp: $F_{MSY} = 9.12$
- White shrimp: $F_{MSY} = 3.48$

Overfished

The overfished threshold is defined as the MSST. The MSST for each penaeid shrimp stock is defined as the minimum spawning stock biomass at MSY (SSB_{MSY}).

- Brown shrimp: SSB_{MSY} is 6,098,824 pounds of tails
- White shrimp: SSB_{MSY} is 365,715,146 pounds of tails

These values will be updated every 5 years through the framework procedure, unless changed earlier by the GMFMC.

Amendment 15 also updated actions to be taken should reference points be exceeded as follows:

- "Annual stock assessments are conducted for the penaeid shrimp species in the Gulf. If MFMT is exceeded for two consecutive years, the appropriate committees and/or panels (e.g. stock assessment panels, advisory panels, SSCs) would convene to review changes in apparent stock size, changes in fishing effort, potential alterations in habitat or other environmental conditions, fishing mortality and other factors that may have contributed to the decline."

NOAA SEFSC Galveston Lab conducts ongoing monitoring and research for the Gulf of Mexico shrimp fishery and produces the following reports: Closure analysis reports for the Texas and Tortugas closure areas, annual stock assessment reports, shrimp stock trend analysis reports, recruitment overfishing monitoring reports, growth overfishing analysis reports, shrimp effort estimation and analysis reports and yield per recruit (YPR) analysis reports.[4]

Penaeid shrimp in the Gulf of Mexico are exempt from requirements for ACLs and Accountability measures (AMs) because they have a life cycle of approximately one year. MSA Section 600.310(h)(2) states:[5]

(2) *Exceptions from ACL and AM requirements*—(i) *Life cycle.*

Section 303(a)(15) of the Magnuson-Stevens Act ``shall not apply to a fishery for species that has a life cycle of approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species'' (as described in Magnuson-Stevens Act section 303 note). This exception applies to a stock for which the average length of time it takes for an individual to produce a reproductively active offspring is approximately 1 year and that the individual has only one breeding season in its lifetime. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule.

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Amendment 15 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2015. http://gulfcouncil.org/docs/amendments/Shrimp%20Amendment%2015%20FINAL.pdf

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] 50 C.F.R. § 600.310 http://www.nmfs.noaa.gov/sfa/CMS_DEV/Councils/Training2013/G1_Nat_Standards_Guidelines.pdf

7.7 Implementation

7.7.1 Has an effective legal and administrative framework been established at the local and national level, as appropriate, for fishery resource conservation and management?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**some**	**no**
Federal: GMFMC was established by the Fishery Conservation and Management Act of 1976 to create fishery management plans (FMPs) as a way to conserve Gulf fishery resources.[1] FMPs serve as a basis for the management of the fisheries of the Gulf's EEZ which begins at the outer limit of the states' jurisdictions and extends 200 nautical miles from the shore. FMPs include federal regulations (implemented by the Secretary of Commerce) that are enforced by the USCG, agents from NOAA Fisheries, and the Gulf states.[2] NOAA Fisheries is responsible for managing the nation's oceanic resources using the Magnuson-Stevens Act and partnering with regional fishery management councils (GMFMC for the Gulf of Mexico) to conduct fish stock assessments, set catch limits, ensure compliance with fishery regulations, and reduce bycatch.[3] NOAA Fisheries, also known as (and referred to above as) NMFS, is an office of the NOAA within the Department of Commerce. It has five regional offices, six science centers, and over 20 laboratories. **Gulf States:** GSMFC was established in 1949 by an act of Congress as a compact of all five Gulf states with the purpose of promoting better utilization of fisheries of the Gulf of Mexico.[4] GSMFC is composed of members from each of the five states. GSMFC does not hold regulatory authority, but is empowered to make recommendations to the legislatures of the five states. Their recommendations are based on scientific studies carried out with state and federal agencies on regional concerns and GSMFC acts as a forum to discuss management practices and fishery concerns of regional		

importance.

<u>Louisiana</u>:
The marine resources of Louisiana are managed by the Louisiana legislature, LWFC and LDWF. The primary authority for managing shrimp is the Louisiana legislature, which enacts legislation through the Louisiana Revised Statutes.[5] Laws are enacted through the legislative process and typically LDWF will develop legislative packages that are then sponsored by legislators; however, legislators also occasionally sponsor their own bills. The Louisiana legislature has delegated some authority to the LWFC and regulations promulgated by the LFWC are enacted through the Louisiana Administrative Code and follow the Administrative Procedures Law.[6] The LWFC, established by Louisiana Revised Statutes Title 56, is charged with protecting, conserving, and replenishing the natural resources of the state and has the authority to define management programs and policies.[7] The LWFC has the authority to control seasons, times, areas, size limits, quotas, take and possession limits and other authorities. The commission may also delegate certain authorities to the Secretary of LDWF. The LDWF, established by Louisiana Revised Statutes Title 36, is the department responsible for executing the laws enacted for management and conservation of natural resources and carries out the management programs and policies defined by the LWFC.[8]

The Louisiana STF has no direct management authority but is charged with advising LDWF and LWFC on matters pertaining to the shrimp fishery.[9] Mandates of the STF include recommendations for improving shrimp production and marketability, and methods to enhance overall performance of the domestic shrimp industry.[10] Meetings of the STF are also governed under the Louisiana Open Meetings Law, and are open to the public.

Louisiana Revised Statutes 56:638.5 define saltwater fishery standards as follows:[11]
The commission shall adopt such rules and regulations, consistent with the authority granted by this Chapter, and in accordance with the Administrative Procedure Act, for the harvesting, conservation, and management of all species of saltwater finfish, in accordance with the following standards:
(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield while maintaining healthy, plentiful stocks. In fact, every effort will be made at all times to prevent a harvest from exceeding the safe upper limit of harvests which can be taken consistently year after year without diminishing the stocks so that the stock is truly inexhaustible and perpetually renewable.
(2) Conservation and management measures shall be based upon the best scientific, economic, biological, anthropological, and sociological information available.
(3) To the extent practicable, an individual stock or unit of fish shall be managed as a unit throughout its range within the state's jurisdictional authority and interrelated stocks of fish and other saltwater resources shall be managed in close coordination.
(4) If it becomes necessary to allocate or assign fishing privileges among various fishermen, such allocations to the extent practicable shall be:
(a) Fair and equitable to all such fishermen.
(b) Reasonably calculated to promote conservation.

(c) Carried out in such a manner that no particular individual, corporation, or other legal entity acquires an excessive share of such privileges. *(d) In the best interest of the citizens of Louisiana.* *(5) Conservation and management measures shall, where practicable, promote efficiency in the conservation and management of fishery resources; except that no such measure shall have economic allocation as its sole purpose.* *(6) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.* *(7) Conservation and management measures may take into account and allow for variations among, and contingencies in, fisheries resources and catches.*		

[1] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/about/index.php

[2] "Gulf Council FAQs" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/resources/education_faqs/education_council_faqs.php

[3] "Our Mission" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/aboutus/our_mission.html

[4] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[5] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[6] La. R.S. 49:950 (Administrative Procedures Act) https://legis.la.gov/Legis/Laws_Toc.aspx?folder=75&level=Parent

[7] La. R.S. § 56 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/34690-title-56/2010title56complete.pdf

[8] La. R.S. § 36:602 https://legis.la.gov/Legis/Law.aspx?d=92804

[9] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

[10] La. R.S. § 56:494 http://law.justia.com/codes/louisiana/2012/rs/title56/rs56-494

[11] La. R.S. § 56:638.5 http://law.justia.com/codes/louisiana/2012/rs/title56/rs56-638-5

7.7.2 (a) Are laws in place that provide for sanctions? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA Fisheries Law Enforcement enforces more than 35 federal statutes that mainly fall within five legislative acts. The Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act of 1972, Endangered Species Act of 1973, Lacey Act Amendments of 1981, and National Marine Sanctuaries Act are enforced by NOAA. Along with 30 other statues, these five legislative acts help		

sustain U.S. fisheries.[1] Each of these legislative acts contains information regarding sanctions for people and vessels that violate these laws in U.S. waters.[2,3,4,5,6] **Louisiana:** Penalties are in place for violations of regulations set by Louisiana legislative statute or LWFC rule and vary based on the type and severity of the violation. There are eight different classes of violations (Class One- least severe through Class Eight- most severe) and penalties may include fines, jail time, loss of fishing license, and forfeiture of property. Penalties also increase for repeat offenses. Penalties range from $50-$7,000 fines and/or jail time ranging from 15 days to one year imprisonment. For details of specific violations and associated penalties, see the Louisiana Shrimp FMP 'Enforcement' section.[7]		

[1] "Laws We Enforce" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/about/what_we_do/laws.html

[2] MSA §307 (Prohibited Acts)http://www.nmfs.noaa.gov/sfa/magact/mag3a.html#s307

[3] 16 U.S.C. 1377 §107 (Enforcement) http://www.nmfs.noaa.gov/pr/laws/mmpa/fulltext.htm#section107

[4] "Lacey Act Amendments of 1981" *U.S. Fish and Wildlife Service*. Web. Accessed November 2015. http://www.fws.gov/laws/lawsdigest/LACEY.HTML

[5] "Legislation" *NOAA National Marine Sanctuaries.* Web. Accessed November 2015. http://sanctuaries.noaa.gov/about/legislation/welcome.html

[6] ESA Section 11 (Penalties) http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section11.pdf

[7] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 63-64. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.7.2 (b) Are these adequate in severity to be effective? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA's Office of General Council publishes all enforcement decisions and orders on a national level.[1] NOAA Fisheries OLE also produces Quarterly reports by region to report on enforcement activities, which includes details on violations issues under each federal act enforced by NOAA agents and reports activities of each of the JEAs for states within that region. The FY15 First Quarter Report reflects active monitoring of fisheries in the Southeast Division with 58 total incidents including 25 incidents reported in violation of the MSA, 4 incidents of the ESA, 10 incidents of the Marine Mammal Protection Act.[2] OLE also maintains a current listing of enforcement actions on its website, and an archived listing of enforcement news reporting OLE program activities.[3,4] The Annual Review of the United States Coast Guard's Mission Performance (2013) report provides details of USCG activities for each division, including marine living resources.[5] According to this report, USCG		

spent 93,004 resource hours on living marine resources activities and compliance rates with fishing regulations has remained above 97%. Additionally, the NOAA SERO publishes information specifically on TED compliance on its website at regular intervals because is a priority for federal enforcement in the Gulf.[6,7] The vast majority of the vessels inspected in 2014 were fully compliant, which indicates the successful nature of the governing regulations. In collecting data on capture and overall TED effective rates, NOAA Fisheries consistently evaluates the degrees of TED violation severity.[8] **Louisiana:** In FY 2013-14, LDWF/LED conducted over 292,000 patrol hours, of which 207,510 were land-based and 84,521 were on the water. There were 732,881 documented contacts by agents with the public and agents issued 12,551 criminal citations and 5,020 warnings and the most common types of citations were fishing without a license, failure to comply with personal flotation device requirements, not abiding by rules and regulations on WMAs, and failure to comply with harvest record regulations.[9] The Louisiana STF website contains an LDWF Enforcement Report with statistics specific to shrimp violations. Between 2002-2012, the number of shrimp violations ranged from 69 to 206 per year, with an average of 137 violations per year and the most common violations included 1) trawling in Closed Season (Inside Waters), 2) Butterflying in Closed Season, 3) Use Skimmers in Closed Season, 4) Use Shrimp net closed waters (specify area and net), and 5) Take and possess shrimp in state waters closed season.[10] The Louisiana Shrimp FMP, Appendix V provides NOAA and USCG enforcement data on TED compliance broken down by state and indicates that the Louisiana shrimp fleet is being actively monitored and maintaining compliance with TED/BRD regulations.[11]		

[1] "Enforcement Decisions and Orders" *NOAA Office of General Counsel.* Web. Accessed November 2015. http://www.gc.noaa.gov/enforce-office6.html#nao

[2] NOAA Fisheries. *Office of Law Enforcement FY15 First Quarter Enforcement Report*. July 2013. http://safmc.net/sites/default/files/Regulations/pdf/NOAAOLE_Q1_2015_PublicReport_Final.pdf

[3] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[4] "News Archive" *NOAA Fisheries Office of Law Enforcement.* Web. Accessed June 2015. http://www.nmfs.noaa.gov/ole/newsroom/08_news_archive.html

[5] Department of Homeland Security, Office of Inspector General. *The Annual Review of the United States Coast Guard's Mission Performance (2013)*. OIG-14-140. September 2014. https://www.oig.dhs.gov/assets/Mgmt/2014/OIG_14-140_Sep14.pdf

[6] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[7] "NOAA assesses civil penalties to shrimpers for alleged Turtle Excluder Device violations." *NOAA News.* National Oceanic and Atmospheric Administration. Web. Accessed November. 2015. http://www.noaanews.noaa.gov/stories2011/2011110311_ole_teds.html

[8] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[9] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

[10] LDWF. *Enforcement Report*. August 2013. http://www.wlf.louisiana.gov/sites/default/files/pdf/document/36907-louisiana-shrimp-fishery-improvement-plan-ldwf-enforcement-report/enforcement_report-final_8-1-13.pdf

[11] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 104-105. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.7.2 (c) Do sanctions affect (refusal/withdrawal/suspension) authorization to fish in the event of non-compliance with conservation and management measures in force?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA Fisheries Office of Law Enforcement protects Gulf fisheries by enforcing federal regulations in the EEZ.[1] Regarding permit sanctions, statutes provide NOAA with broad authority to suspend or revoke. While suspension and revocation are effective deterrents, NOAA acknowledges that such sanctions have financial consequences beyond the alleged violator. Given this potential negative impact, permit sanctions are only imposed in situations considered "moderate to major" in terms of significance of offence. Permit suspensions include 5-20 days, 20-60 days, 60-180 days, and 180 days to one year. Prior history of violations is considered when determining the appropriate suspension length. Permit revocation is allowed in extreme cases (16 U.S.C. § 1858(g)(i)) including where a permit is obtained fraudulently or where other penalties (fines or permit suspensions) do not address the seriousness of the offence. Permit revocation can only take place with approval of the NOAA General Counsel or Deputy General Counsel.[2] **Louisiana:** Penalties for violations range in severity depending on the class of violation and the number of repeat offenses. For Class 1,2,3,4,6, and 7 violations, in addition to fines and/or jail time, a license can be revoked for the period in which it was issued. For Class five violations, in addition to other penalties, licenses are revoked for the period of issue and cannot be reinstated for one year after the period of issue.[3]		

[1] "Law Enforcement FAQs" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/faqs.html

[2] NOAA Fisheries. "Penalty Matrix for Endangered Species Act" *NOAA Policy for Assessment of Penalties and Permit Sanctions*. March 2011. http://www.shrimpalliance.com/new//wp-content/uploads/2012/03/2pagesfromPenaltyPolicy.pdf

[3] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Page 63. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.7.3 Are there, where appropriate, in place:

(i) - monitoring control and surveillance schemes? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
State and federal agencies have strong measures in place for monitoring, surveillance and control of fishery resources. Refer to 7.1.7(a) for full details on programs and activities for monitoring, control and surveillance of the Louisiana shrimp fishery.		

7.7.3 (ii) - observer programs? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Amendment 13 of the Shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition. These methods include the implementation of an ELB for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition.[1] Due to the high costs of outfitting boats with observers, NOAA Fisheries determined that 1% coverage would be adequate to document information on bycatch composition in the fishery and these data could be combined with detailed effort data from ELBs to extrapolate total bycatch numbers for the fishery. Observer data goes into the SEDAR process and is utilized in models to determine bycatch of individual species, which is then used in assessments of those species. The most recent report for shrimp trawl observer coverage published in 2012 indicates that observer coverage is about 2% for the Gulf and South Atlantic shrimp fisheries due to decreases in effort in the fishery.[2] Federal Gulf shrimp permit holders are required to carry an onboard observer if selected by the SERO to participate in the Galveston Laboratory Observer Program. This requirement is mandated by 50 CFR 622.52 and participation is a condition for annual renewal of federal shrimp permits.[3] Permit holders are selected by the Southeast Regional Director through a stratified random sampling method. 50 CFR 622.52 requires any vessel with a Gulf commercial shrimp vessel permit, if selected by the SRD, to carry a NMFS-approved observer and allow the observer free and unobstructed access to the vessel's bridge, working decks, holding bins, weight scales, holds, and any other spaces used to hold, process, weigh or store fish.		

The Galveston Lab Shrimp Bycatch Reduction Device Evaluation Research consists of onboard monitoring and scientific data analysis of the Gulf of Mexico shrimp fleet. The Observer Program evaluates species composition of shrimp trawl bycatch, and efficacy of TEDs and BRDs.[4] The fishery Observer Program was established in 1987 as a voluntary program through the Gulf and South Atlantic Fisheries Foundation, Inc. (GSAFF) and became cooperative research program in 1992 between GSAFF and NOAA Fisheries. The Shrimp FMP amendment 13 made the program mandatory for the Gulf of Mexico shrimp fleet in federal waters.[5] The Galveston Lab Observer Program is part of National Observer Program under NOAA Office of Science and Technology.[6] Data collection by observers is carried out under standardized protocols defined in an observer training manual specific to the Southeast otter trawl and reef fish fisheries. [7] In 2012, observer coverage was added for the inshore skimmer trawl fishery in the northern Gulf of Mexico due to increased sea turtle stranding reports and coverage continued in 2013 and 2014.[8] The primary objectives were to document interactions with threatened or endangered sea turtles during commercial shrimping operations and to quantify both target and non-target species by area. Coverage is currently low due to difficulties with accurate contact information in state license databases, significant changes in the inshore fleet due to economic difficulties, lack of vessel insurance (which is a requirement for carrying observers), and difficulty in determining participants based on gear type since some states do not issue licenses based on gear type. Reports on the skimmer trawl observer coverage are published annually. Authority to mandate observer coverage falls under the ESA and MSA.[9]		

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[3] 50 C.F.R. § 622.52 http://www.gpo.gov/fdsys/granule/CFR-2013-title50-vol12/CFR-2013-title50-vol12-sec622-52

[4] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[5] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[6] "National Observer Program: Shrimp" *NOAA Office of Science and Technology*. Web. Accessed November 2015. https://www.st.nmfs.noaa.gov/observer-home/regions/southeast/shrimp

[7] NMFS. Observer Training Manual: Characterization of the US Gulf of Mexico and Southeastern Atlantic Otter Trawl and Bottom Reef Fish Fisheries. September 2010. https://www.st.nmfs.noaa.gov/Assets/Observer-Program/pdf/Shrimp_Reef_fish_Manual_9_22_10.pdf

[8] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[9] "2015 Annual determination to implement Sea Turtle Observer Requirement" *Federal Register*. Web. Accessed November 2015. https://www.federalregister.gov/articles/2015/03/19/2015-06341/2015-annual-determination-to-implement-the-sea-turtle-observer-requirement

7.7.3 (iii) - inspection schemes? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Marine resource laws are enforced by both the USCG and NOAA Office of Law Enforcement. Vessels are subject to inspection by both the USCG, and NOAA enforcement agents.[1,2] The MSA, Section 311 authorizes the following:[3] *(b) POWERS OF AUTHORIZED OFFICERS.—* *(1) Any officer who is authorized (by the Secretary, the Secretary of the department in which the Coast Guard is operating, or the head of any Federal or State agency which has entered into an agreement with such Secretaries under subsection (a)) to enforce the provisions of this Act may—* *(A) with or without a warrant or other process— (i) arrest any person, if he has reasonable cause to believe that such person has committed an act prohibited by section 307;* *(ii) board, and search or inspect, any fishing vessel which is subject to the provisions of this Act;* *(iii) seize any fishing vessel (together with its fishing gear, furniture, appurtenances, stores, and cargo) used or employed in, or with respect to which it reasonably appears that such vessel was used or employed in, the violation of any provision of this Act;* *(iv) seize any fish (wherever found) taken or retained in violation of any Provision of this Act;* *(v) seize any other evidence related to any violation of any provision of this Act; and* *(vi) access, directly or indirectly, for enforcement purposes any data or information required to be provided under this title or regulations under this title, including data from vessel monitoring systems, satellite-*		

based maritime distress and safety systems, or any similar system, subject to the confidentiality provisions of section 402;
(B) execute any warrant or other process issued by any court of competent jurisdiction; and
(C) exercise any other lawful authority.
(2) Subject to the direction of the Secretary, a person charged with law enforcement responsibilities by the Secretary who is performing a duty related to enforcement of a law regarding fisheries or other marine resources may make an arrest without a warrant for an offense against the United States committed in his presence, or for a felony cognizable under the laws of the United States, if he has reasonable grounds to believe that the person to be arrested has committed or is committing a felony. The arrest authority described in the preceding sentence may be conferred upon an officer or employee of a State agency, subject to such conditions and restrictions as are set forth by agreement between the State agency, the Secretary, and, with respect to enforcement operations within the exclusive economic zone [and special areas], the Secretary of the department in which the Coast Guard is operating.*

The USCG Living Marine Resources program provides at-sea enforcement of federal fisheries regulations and other regulations relating to national goals for conservation and management of living marine resources and their environments. To enforce these laws, all USCG officers and petty officers have the authority to board and inspect and United States vessel in any location.[4]

Louisiana:
Louisiana Revised Statutes 56:55 grants inspection authority to wildlife enforcement agents as follows:[5]
§55. Search with or without warrant
A. The secretary, the deputy secretary, or any commissioned wildlife enforcement agent of the enforcement division may visit, inspect, and examine, with or without search warrant, records, any cold storage plant, warehouse, boat, store, car, conveyance, automobile or other vehicle, airplane or other aircraft, basket or other receptacle, or any place of deposit for wild birds, wild quadrupeds, fish, or other aquatic life or any parts thereof whenever there is probable cause to believe that a violation has occurred.
B. Commissioned wildlife enforcement agents of the enforcement division are authorized to visit or inspect at frequent intervals without the need of search warrants, records, cold storage plants, bait stands, warehouses, public restaurants, public and private markets, stores, and places where wild birds, game quadrupeds, fish, or other aquatic life or any parts thereof may be kept and offered for sale, for the purpose of ascertaining whether any laws or regulations under the jurisdiction of the department have been violated. They also shall inspect establishments for commercial licenses required by the department to retail and/or wholesale commercial fish and bait fish where applicable under the provisions of this Chapter.

[1] United States Coast Guard. *Special Notice to Mariners*. 2001. http://www.uscg.mil/d1/prevention/NavInfo/navinfo/documents/Enforcement.PDF

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[4] United States Coast Guard, 2001.

[5] La. R.S. 56:55 https://legis.la.gov/Legis/Law.aspx?d=105379

7.7.3 (iv) - vessel monitoring schemes? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Federally permitted commercial shrimp vessels in the Gulf of Mexico EEZ are required to participate in an electronic logbook (ELB) program.[1] Amendment 13 of the GMFMC Shrimp FMP implemented an ELB program for the federal shrimp fleet to better track shrimp effort and location.[2] The main purposes of this program are to provide more accurate data to inform annual shrimp stock assessments and annual assessments of mortality for several known bycatch species of the shrimp trawl fishery including red snapper, sea turtles, blacknose shark, and smalltooth sawfish.[3] If selected, vessels must carry a data recording device, which is a time-stamped GPS unit that records vessel location at 10-minute intervals. Under the initial ELB program (which began in 2007), data were collected by a technician who met the boat at the dock to download data from the device. Under the new cELB system (which began in 2014), data are transmitted directly to the Galveston Lab through a cellular network when the vessel is in cellular range.[4] Data are compiled and analyzed in shrimp effort estimate reports every four months. Participants are selected by the Southeast Regional Director through a stratified random sampling method, and 500 vessels (approximately 1/3 of the fleet) has been selected to participate each year since the start of the program. Participating vessels must annually report information regarding the size and number of shrimp trawls deployed and the types of BRDs and TEDs used. Participation, if selected, is a condition of renewal for federal permits. **Louisiana:** LDWF does not currently require VMS devices for the commercial shrimp fleet in Louisiana; however, VMS units are required for harvesting shrimp for live bait under a Special Bait Dealer Permit, and as a penalty for certain commercial shrimp violations.[5,6] For violators convicted of shrimping during a closed season, the violator may not be present on a vessel harvesting or possessing shrimp or shrimp gear unless the vessel has an operating VMS device that is accessible by LDWF.		

[1] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] GMFMC. *Framework Action to Establish Funding Responsibilities for the Electronic Logbook Program in the Shrimp Fishery of the Gulf of Mexico*. 2013.
http://gulfcouncil.org/docs/amendments/Final%20Shrimp%20ELB%20Abbreviated%20Framework.pdf

[4] "SPGM Electronic Log Book" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015.
http://www.galvestonlab.sefsc.noaa.gov/ELB/

[5] "Live Bait Shrimp" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015.
http://www.wlf.louisiana.gov/fishing/live-bait-shrimp

[6] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 64
http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

7.7.5 (a) Have States which are members of or participants in subregional or regional fisheries management organizations or arrangements taken steps to implement (into legislation and practice) agreed measures adopted in the framework of such organizations or arrangements?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Management measures developed by the GMFMC through FMPs and amendments are carried out by NOAA SERO and implemented into regulation through the Code of Federal Regulations (CFR). Regulations that are promulgated through the CFR are required by law for all participants fishing in the U.S. EEZ and are enforced by NOAA Fisheries Law Enforcement and the U.S. USCG Living Marine Resources division.[1,2,3] Regulations made by GMFMC are respected by the individual states and state regulations for territorial waters are consistent with federal regulations.[4] Each of the five Gulf states has a JEA with NOAA Fisheries through the Cooperative Enforcement Program which allows U.S. state conservation law enforcement officers to enforce federal laws and regulations pertaining to marine resources and endangered species.[5]		

[1] 50 C.F.R. § 622
http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/documents/pdfs/current_50cfr622_regulations.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015.
http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[4] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[5] "Cooperative Enforcement Programs" *NOAA Fisheries.* Web. Accessed November 2015.
http://www.nmfs.noaa.gov/ole/about/our_programs/cooperative.html

7.7.5 (b) In particular, have measures been adopted to deter the activities of vessels of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: According to the U.S. Code of Federal Regulations, it is unlawful for any person to "engage in an activity for which a valid Federal permit, license, or endorsement is required under this part without such permit, license, or endorsement."[1] Applicants must submit the Federal Permit Application for Vessels Fishing in the EEZ to the NOAA Fisheries Southeast Regional Permits Office.[2] No person or vessel may harvest shrimp or possess shrimp in or from the Gulf EEZ without a commercial vessel permit on board.[3] NOAA Enforcement and USCG monitor and enforce these regulations in federal waters. **Louisiana:** No vessels may operate in Louisiana territorial waters without an appropriate license. Waters are patrolled by LDWF enforcement agents to ensure that all vessels participating in fishing activities have the proper authorization.[4]		

[1] 50 C.F.R. § 622.13 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_113

[2] "Permits" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[3] 50 C.F.R. § 622.4 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_14

[4] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

Article 8 - Fishing Operations

8.1 Duties of all States

8.1.1 Are States involved in the fishery ensuring that only fishing operations allowed by them are conducted within waters under their jurisdiction and that these operations are carried out in a responsible manner? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: According to the U.S. Code of Federal Regulations, it is unlawful for any person to "engage in an activity for which a valid Federal permit, license, or endorsement is		

required under this part without such permit, license, or endorsement."[1] Applicants must submit the Federal Permit Application for Vessels Fishing in the EEZ to the NOAA Fisheries Southeast Regional Permits Office.[2] No person or vessel may harvest shrimp or possess shrimp in or from the Gulf EEZ without a commercial vessel permit on board.[3] NOAA's Office of Law Enforcement protects oceanic wildlife and habitat through enforcement of domestic laws and international treaty requirements. Special agents and enforcement officers ensure compliance with U.S. marine resource laws and take action when laws are violated.[4] NOAA's Office of the General Counsel is responsible for prosecuting civil penalty cases, permit sanctions, and administrative forfeitures. Together, these two offices ensure that fishery regulations in the Gulf EEZ are administered and adhered to by resource users.[5] **Louisiana:** No fishing vessels may operate in Louisiana territorial waters without an appropriate license issued by LDWF.[6] Licenses are available for both Louisiana residents and non-residents of other U.S. Gulf States.[7] The other four Gulf states also maintain similar licensing requirements for fishing activities within their state territorial waters.[8] License requirements for recreational and commercial fishing are published annually by LDWF in print and online. Louisiana waters are patrolled by LDWF enforcement officers to ensure that all vessels participating in fishing activities have the proper authorization and follow all state and federal fishing regulations.[9]		

[1] 50 C.F.R. § 622.13 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_113

[2] "Permits" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[3] 50 C.F.R. § 622.4 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_14

[4] "Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/about/what_we_do.html

[5] *NOAA Office of General Counsel*. Web. Accessed November 2015. http://www.gc.noaa.gov/enforce-office.html

[6] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[7] "Harvesters Licenses and Fees" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/harvest-licenses-and-fees

[8] GSMFC 2013. *Licenses & Fees for Alabama, Florida, Louisiana, Mississippi, and Texas in Their Marine Waters for the Year 2012*. Gulf states Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20219.pdf

[9] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

8.1.2 Are States involved in the fishery maintaining a record, updated at regular intervals, on all authorizations to fish issued by them? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: NOAA Fisheries SERO Permits Office is tasked with managing federal fishing permits of the Gulf of Mexico.[1] The SERO Permits Office issues permits for 7 to 17 months. By renewing a permit before the expiration date, the permit may be extended for another year. Limited access (or moratorium) permits are allowed to be transferred, which means the permit holder may change ownership of the permit or the vessel the permit is assigned to for fishing purposes. The Southeast Permits Office also manages the Catch History for vessels and permits, which can be requested by the permit or vessel owner.[2] Vessel permits are kept internally, and are also available online. Information regarding the vessel, permit holder address, permit effective date and expiration date are listed on the NOAA Fisheries SERO website.[3] **Louisiana:** Commercial fishing licenses issued by LDWF are renewed annually and LDWF maintains a record of all licenses sold.[4,5] Additionally, seafood dealers and processors can only purchase seafood from a harvester with a valid commercial fishing license and are required to report harvest data monthly through the Trip Ticket Program.[6]		

[1] "Permits" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[2] "Permits FAQ" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[3] "Permit Holder Information" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/SPGM.htm

[4] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[5] "Harvesters Licenses and Fees" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/harvest-licenses-and-fees

[6] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

8.1.3 Are states involved in the fishery maintaining, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations allowed by them? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The SEFSC Fisheries Monitoring Branch monitors the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[1] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico (refer to 7.1.4(a) for full details on the GSS).[2] Furthermore, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal.[3] ALF forms are mailed to permit holders each spring to report on landings from the previous year. Data are also collected on the shrimp fishery through the Electronic Logbook (ELB) Program and the Observer Program (refer to 7.1.7(a) for full details on these programs).[4,5] NOAA Fisheries SERO Permits Office is tasked with managing federal fishery permits of the Gulf of Mexico.[6] The Southeast Permits Office issues permits for 7 to 17 months. Limited access (moratorium) permits are allowed to be transferred, which means the permit holder may change ownership of the permit or the vessel the permit is assigned to for fishing purposes. The Southeast Permits Office also manages the Catch History for vessels and permits, kept internally, but can be made available to the permit or vessel owner upon request.[7] Records of vessel permits are kept internally by the Permits Office, and are also posted online; information regarding the vessel identification, vessel name, permit holder address, permit effective date and expiration are listed on the SERO website. Vessels operating in the EEZ are required to register with the USCG. All vessels measuring over five tons (generally any vessel over 25 ft length) are required to have a Certificate of Documentation issued through USCG and the USCG maintains records of all federally documented vessels.[8] NOAA SEFSC also produces the Economics of the Federal Gulf Shrimp Fishery Annual Report. This document discusses shrimp landings, revenue, permits, vessel, and economic status of the shrimp fishery. This report is based on data collected through surveys from permit holding harvesters from across the Gulf states. Information gathered from this survey helps determine economic trends of the industry and helps understand the social and economic impacts regulation changes may have on the fishery and communities.[9] NOAA SEFSC Galveston Lab conducts ongoing monitoring and research for the		

Gulf of Mexico shrimp fishery and produces the following reports: closure analysis reports for the Texas and Tortugas closure areas, annual stock assessment reports, shrimp stock trend analysis reports, recruitment overfishing monitoring reports, growth overfishing analysis reports, shrimp effort estimation and analysis reports and YPR analysis reports.[10] **<u>Louisiana</u>:** LDWF conducts both fishery-dependent and fishery-independent data collection to determine fishery trends and status of stocks. Fishery dependent data are gathered and monitored through the trip ticket program (refer to 7.1.7(a) for full details).[11] LDWF requires a Commercial Fisherman's License to harvest fish or shellfish in Louisiana waters.[12] For shrimp, harvesters are also required to hold appropriate gear licenses that must be renewed annually and records are maintained by LDWF. Commercial boats must have a commercial vessel license in addition to fishing and gear licenses. Vessel registration and commercial vessel licenses are completed through LDWF and all boat registration records are maintained. Data from license sales and the trip ticket program are reviewed regularly and analyzed by LDWF's Socioeconomic Research and Development Section. The Louisiana Shrimp FMP contains the most recent data on shrimp fishery operations including number of fishermen, fishing effort and landings statistics by volume, value, area fished, gear type, and season.[13] The GSMFC also conducts monitoring and review processes on an annual basis for fishery data. The GSMFC programs: FIN, IJF, Fisheries Economic Data Program, SEAMAP all work to standardize the format of the data collection process based on program needs and coordinate with state agencies and other partners to carry out regular data collection and review.[14]		

[1] "Fisheries Monitoring Branch" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/data/monitoring.htm

[2] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[3] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[4] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[5] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[6] "Permits FAQ" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[7] "Permit Holder Information" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/SPGM.htm

[8] "National Vessel Documentation Center" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/hq/cg5/nvdc/nvdcfaq.asp#04

[9] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[10] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[11] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

[12] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 15 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[13] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[14] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

8.1.4 Are States involved in the fishery, within the framework of subregional or regional fisheries management organizations or arrangements, cooperating to establish systems for monitoring, control, surveillance and enforcement of applicable measures with respect to fishing operations and related activities in waters outside their jurisdiction? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Each of the five Gulf States and NOAA Fisheries cooperate with neighboring state and federal agencies on monitoring and enforcement of the fishery across state jurisdictional boundaries. All states are actively involved in regional organizations, GSMFC and GMFMC, and cooperate in establishing systems for monitoring, control, surveillance and enforcement of fishing operations throughout the Gulf of Mexico through these organizations.[1,2] All five Gulf States currently hold cooperative agreements with federal partners through the JEA program.[3] The JEA is a formal partnership between NOAA Fisheries and each state agency on enforcement related activities that provides federal funding to state and territorial law enforcement agencies to perform enforcement of federal regulations. The GSMFC has a Law Enforcement Committee (LEC) that addresses regional fisheries enforcement needs and objectives.[4] The LEC consists of members from all five U.S. Gulf of Mexico states, NOAA's Office of Enforcement, and the USCG, with regular input from NOAA General Counsel and USFWS. The GSMFC IJF program also utilizes the LEC for advice during the FMP development process.		

GSMFC published a regional pocket guide for use by enforcement officers from all agencies.[5] GSMFC's LEC periodically convenes special work sessions to revise LEC's Operations and Strategic Plans to improve efforts towards regional enforcement goals.[6,7] GMFMC has a Law Enforcement AP that advises the council on regional enforcement matters.[8] Enforcement of federal regulations developed through GMFMC are handled by NOAA Fisheries and USCG, and reported at regular intervals.[9]		

[1] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[2] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/

[3] "Cooperative Enforcement Programs" *NOAA Fisheries.* Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/about/our_programs/cooperative.html

[4] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[5] VanderKooy, S.J. 2014. *Rules and Regulations: Officer's Pocket Guide 2014-2015*. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20230.pdf

[6] VanderKooy, S.J. 2012. *Gulf of Mexico Cooperative Law Enforcement Operations Plan 2013-14*. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20208.pdf

[7] VanderKooy, S.J. 2012. *Gulf of Mexico Cooperative Law Enforcement Strategic Plan 2013-2016*. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20207.pdf

[8] "Advisory Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/panels_committees/advisory_panels.php#LawEnforcement

[9] NMFS. *First Quarter FY 2008 Report, Gulf of Mexico and South Atlantic/Caribbean*. NOAA/NMFS Office for Law Enforcement Southeast Division. 2008. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/BB%202008-04/P%20-%20Enforcement%20Reports.pdf

8.1.7 Are education and training programs enhancing the education and skills of fishers and, where appropriate, their professional qualifications, taking into account agreed international standards and guidelines? **Yes...[1] Some... [½] No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Louisiana Sea Grant is a federal/state partnership administered by NOAA pairing Sea Grant resources with academic institutions and includes McNeese State University, University of Louisiana at Lafayette, Southern University, Louisiana State University, Southeastern Louisiana University, Nicholls State University, University of New Orleans, Tulane University, Xavier University, and LUMCON (Louisiana University Marine Consortium).[1] Louisiana Sea Grant's project center around four initiatives: healthy ecosystems and habitats,		

resilient communities and economies, sustainable fisheries and aquaculture, and education and workforce development. In partnership with LSU Agricultural Center and LDWF, Louisiana Sea Grant developed the Louisiana Fisheries Forward Program (LFF), focused on education, quality, and sustainability. Currently, for the shrimp industry, LFF organizes education workshops and seminars for commercial fishermen. Participation in these seminars is voluntary. Texas Sea Grant has also been active in training fishermen and captains across the Gulf of Mexico. In 2014, as part of a grant from the NFWF, a marine extension agent and a marine fisheries specialist traveled to conduct dockside inspections, reaching 500 captains and crewmembers.[2] The Gulf and South Atlantic Fisheries Foundation is a private, regional nonprofit research and development organization focused on the development of commercial fisheries in the South Atlantic and Gulf of Mexico. The foundation has been active hosting workshops for commercial fishermen for at least 30 years. Efforts focused on in TED and BRD research and development and gear outreach have been deemed successful by NMFS and the Foundation.[3] The most recent outreach efforts by the Foundation were from 2011-2013.[3] In that time period, the Regional Coordinators for the project traveled to eight States in the Gulf and South Atlantic, visiting 74 cities. The Coordinators disseminated TED and BRD instruction manuals in English, Spanish, and Vietnamese. Additionally, TEDs were inspected according to the NOAA Boarding Form to check for any non-compliances while boats were still at the dock and could address any issues. NOAA, in addition to being responsible for enforcement of TEDs, also has a Gear Monitoring Team (GMT) dedicated to outreach and education on TED regulations. The GMT may conduct targeted to areas of non-compliance based on boarding records.[4] The GMT coordinator's contact information is also published on NOAA's SEFSC website and he can be contacted directly to do dockside inspections with no penalty attached prior to a vessel's departure.[5]		

[1] *Louisiana Sea Grant*. Web. Accessed November 2015. http://www.laseagrant.org/about/academic-partners/

[2] *Texas Sea Grant.* Web. Accessed November 2015. http://texasseagrant.org/staff/tony-reisinger/

[3] Helies, F.C. Graham, G., Parker, L., Jamison J. 2013. An Expanded Outreach Program and Technology Transfer of Updated Bycatch Reduction Devices and Turtle Excluder Devices to the Southeastern U.S. Shrimp Industry. Final Report. http://www.gulfsouthfoundation.org/uploads/reports/118_final_report.pdf

[4] NOAA Fisheries. *Southeast Fishery Bulletin.* February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[5] "Sea Turtle Staff" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/turtles/staff.htm

8.1.8 Are records of fishers being maintained which should, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	<u>Federal</u>: NOAA Fisheries SERO Permits Office is tasked with managing federal fishing permits of the Gulf of Mexico.[1] The Southeast Permits Office issues permits for seven to 17 months. By renewing a permit before the expiration date, the permit may be extended for another year. Limited access (or moratorium) permits are allowed to be transferred, which means the permit holder may change ownership of the permit or the vessel the permit is assigned to for fishing purposes. The Southeast Permits Office also manages the Catch History for vessels and permits, which can be requested by the permit or vessel owner.[2] Vessel permits are not only kept internally, but also available online. Information regarding the vessel, permit holder address, permit effective date and expiration date are listed on the NOAA Fisheries SERO website.[3] Vessels operating in the EEZ are required to register with the USCG. All vessels measuring over five net tons (generally any vessel over 25 ft length) are required to have a Certificate of Documentation through the USCG.[4] Each vessel must be marked with Certificate number and hailing port, and the Certificate of Documentation must be carried onboard the vessel. Certificates are valid for one year and USCG maintains records of all Certificates of Documentation. Fishing vessels must also obtain a fishing endorsement to participate in commercial fishing activities in the EEZ. USCG provides training and issues certificates for Master of Vessels for 25/50/100 Gross Ton vessels.[5] For vessels of 20 gross tons or more, the master of the vessel must have a written agreement with each crewmember on the terms of employment as a crewmember. Crewmembers must be U.S. citizens or aliens with legal documentation to work in the U.S.[5] The Captain (Master or individual in charge of the vessel) must be a U.S. citizen. There are no competency requirements, certificates, or licenses required for crew members. **<u>Louisiana</u>:** LDWF requires a commercial fishing license to harvest fish or shellfish in Louisiana waters. For shrimp, the person responsible for operation of the vessel is required to hold a Commercial Fisherman's License and the appropriate gear licenses (shrimp trawl, skimmer trawl, or butterfly net licenses) and must be onboard the vessel during operation.[6] No documentation is required for additional crew members. There are currently no competency requirements for the Louisiana shrimp fishery. Licenses must be renewed annually and records are maintained by LDWF.[7] Commercial boats also require a commercial vessel license if operating south of the saltwater line. Boat registration is completed through LDWF and all boat registration records (titles) are maintained. LDWF, in partnership with Louisiana Sea Grant, has developed the Fisheries Forward Program to provide professionalism training to commercial fishermen in	

	Louisiana. This is a voluntary program and no certificates are issued.[8]	

[6] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[7] "Harvesters Licenses and Fees" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/harvest-licenses-and-fees

[8] "Boat Title and Registration" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/boating/boat-title-and-registration

[9] *Louisiana Fisheries Forward*. Web. Accessed December 2015. http://lafisheriesforward.org/

8.1.9 Do measures applicable in respect of masters and other officers charged with an offence relating to the operation of fishing vessels include provisions which may permit, *inter alia*, refusal, withdrawal or suspension of authorizations to serve as masters or officers of a fishing vessel? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
No	**Some**	**no**
	Federal: There are no provisions which may permit the refusal or suspension of authorizations to serve as masters or officers of a fishing vessel as a means to enforce federal regulations. Federal shrimp fishing permits are attached to the fishing vessel itself and can be suspended or revoked, as explained in 7.7.2 (c).[1] **Louisiana:** The Louisiana shrimp fishery does not designate masters and officers within the fishing fleet. LDWF requires a Commercial Fisherman's License and appropriate gear licenses to participate in the fishery and these licenses may be revoked as a penalty for violating commercial and/or recreational fishing regulations as detailed in 7.7.2(c).[2]	

[1] "SERO Permits Office" *NOAA Fisheries*. Web. Accessed December 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/index.html

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Page 63. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

8.1.10 Is an attempt being made to ensure that, through education and training, all those engaged in fishing operations are given information on the most important provisions of this Code, as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: GMFMC and NOAA Fisheries publish fishing regulation guides and bulletins		

containing all regulations and other necessary information regarding commercial fishing in the EEZ. These regulations are posted on websites, distributed through newsletters and published in print form.[3] These regulations, as illustrated in other areas of this report, are largely consistent with the important provisions of the CCRF and other relevant international conventions and standards that are applicable to responsible fishing operations. **Louisiana:** LDWF publishes a commercial fishing regulation guide containing all regulations and other necessary information regarding the practice of commercial fishing in Louisiana.[4] These regulations and additional information are publicized on the LDWF website and distributed through emails, text messages and social media outlets.[5,6] As illustrated in other areas of this report, the regulations are largely consistent with the important provisions of the CCRF and other relevant international conventions and standards that are applicable to responsible fishing operations. Additionally, LDWF, in partnership with Louisiana Sea Grant, has developed the Fisheries Forward Program to provide professionalism training to commercial fishermen in Louisiana.[7]		

[1] "Fishing Regulations" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/index.php

[2] "Regulations/Policy Branch" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/policy_branch/index.html

[73] "Fishery Bulletins" *NOAA Fisheries Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/fishery_bulletins/index.html

[4] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[5] "Shrimp Regulations" Louisiana Department of Wildlife and Fisheries. Web. Accessed Nov. 2015. http://www.wlf.louisiana.gov/fishing/shrimp-1

[6] "Commercial Fishing Email and Text Notification" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/signup

[7] *Louisiana Fisheries Forward*. Web. Accessed December 2015. http://lafisheriesforward.org/

8.2 Flag State duties

8.2.1 (a) Are states maintaining records of fishing vessels authorized to fish, which indicate details of the vessels, their ownership and authorization to fish? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal:		

NOAA Fisheries SERO Permits Office is tasked with managing federal fishing permits of the Gulf of Mexico.[1] Refer to 8.1.2 for full details. **Louisiana:** A Commercial Fisherman's License is required to harvest fish in coastal and marine waters of the state, and fishing activity is documented through the Trip Ticket Program.[2,3] Refer to 8.1.2 for full details.		

[1] "Permits" NOAA Southeast Regional Office. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/permits/permit_faq/

[2] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[3] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

8.2.1 (b) Have such vessels have been issued with, and carry on board, a license/permit and authorization to fish? ***Yes...***[1] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: To fish for shrimp in the Gulf's EEZ, a commercial vessel permit for Gulf shrimp must have been previously obtained and must be aboard the vessel.[1] **Louisiana:** A Commercial Fisherman's License and appropriate gear licenses are required and must be renewed annually. A physical license are issued and persons engaged in commercial fishing are required to show an original, valid license upon demand if requested by an LDWF agent.[2]		

[1] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_150

[2] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

8.2.4 Is there legislation requiring fishing gear to be marked, taking into account uniform and recognizable gear marking systems, in order that the owner of the gear can be identified? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Shrimp gear remains attached to the vessel continuously while fishing; therefore, there are no specific regulations requiring the marking of gear at the state or federal level, with the exception of butterfly nets in Louisiana waters.[1,2] Butterfly nets in use within Cameron Parish are required to be tagged with the fisherman's name, address and net license number. Vessels are required to be marked with the appropriate state and/or federal identification numbers.		

[1] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[2] GMFMC. *Commercial Fishing Regulations for Gulf of Mexico Federal Waters.* January 2015. http://gulfcouncil.org/fishing_regulations/CommercialRegulations.pdf

8.2.7 (a) Are states taking enforcement measures in respect of fishing which have been found by them to have violated applicable conservation and management measures, including, where appropriate, making the violation of such measures an offence under state legislation?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Fishing regulations are mandated under state and federal legislation and strictly enforced by several agencies. Refer to 7.7.2(a) for details of laws pertaining to fishing regulations and enforcement activities in place to ensure compliance.		

8.2.7 (b) Are sanctions applicable in respect of violations and illegal activities adequate in severity to be effective in securing compliance and discouraging violations wherever they occur?
Yes...[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Penalties and sanctions for violating state and federal fishing regulations are in place and actively enforced. Law enforcement reports by several agencies indicate that compliance is high. Refer to 7.7.2(b) for full details on sanctions and compliance of the Louisiana shrimp fishery.		

8.4 Fishing operations

8.4.2 Have States prohibited within national (or state) legislation dynamiting, poisoning and other comparable destructive fishing practices? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**some**	**no**
Federal: The U.S. Code of Federal Regulations prohibits destructive fishing practices, including use of explosives, toxic chemicals or plants, fish traps, bottom trawls without weak links, and the use of Gulf reef fish as bait.[1] **Louisiana:** Dynamiting, poisoning, the use of stupefying substances and guns are not permitted methods for catching fish or shellfish in the waters of Louisiana.[2]		

[1] 50 C.F.R. § 622.9 http://www.ecfr.gov/cgi-bin/text-idx?SID=7663a4568ee406f4e5bcf64f9bfd4de2&node=pt50.12.622&rgn=div5#se50.12.622_19

[2] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

8.4.3 (a) Is documentation required with regard to fishing operations, retained catch of fish and non-fish species and, as regards discards, the information required for stock assessment as decided by relevant management bodies, collected and forwarded systematically to those bodies?

(i) - documentation on fishing operations **Yes...[1]Some... [½]No...[0]**

Extent of compliance		
Yes	**Some**	**No**
Documentation on fishing operations is maintained by state and federal agencies for fishing activities in Louisiana and U.S. Gulf of Mexico waters. Refer to 8.1.3 for details on requirements and documentation maintained by each agency.		

8.4.3 (a)(ii) - documentation on non-fish catches **Yes...[1]Some... [½]No...[0]**

Extent of compliance		
Yes	**Some**	**No**
	<u>Federal</u>: NOAA Fisheries does not require the direct reporting of non-fish species; however, reporting of interactions with some species is required by the Office of Protected Species. The NOAA Office of Protected Resources annually reviews interactions between fisheries and the protected species under management. There are currently 125 endangered or threatened marine species that fall under NOAA jurisdiction through the ESA, and all marine mammals under the MMPA.[1] *ESA species*: There are several species listed under the ESA as threatened or endangered that are known bycatch of the shrimp fishery, including all five sea turtle species found in the Gulf of Mexico, smalltooth sawfish and Gulf sturgeon.[2] There is currently no direct reporting requirement for interactions with these species. NOAA Office of Protected Resources calculates the annual take of some protected species based on data from the Observer Program combined with detailed shrimp effort data from the ELB program.[3] Compliance with TED requirements is also monitored and the Gulf of Mexico shrimp fishery and used to estimate take of sea turtles. The fishery must maintain an 88% TED effectiveness rating, otherwise NOAA is required to take action to reduce potential mortality, including possible closure of the fishery.[4] *Marine Mammals:* The office of Protected Resources currently lists the Gulf of Mexico shrimp fishery as a Category II fishery, indicating that the annual mortality or serious injury of a marine mammal stock is greater than 1% but less than 50 % of the stocks potential biological removal (PBR).[5] The Gulf of Mexico shrimp fishery is known to interact with bottlenose dolphins. Lack of a calculated PBR for the Gulf of Mexico bottlenose dolphin populations, data from stranding programs, and low observer coverage in the fishery are all reasons that prompted NOAA to assign a Cat. II ranking. Cat. II designation requires that each fishery participant be registered with	

	the Office of Protected Species and carry an authorization certificate. Typically, registration with the Marine Mammal Authorization Program is combined with state and federal permitting systems and all fishermen receiving permits are registered with the Office of Protected Species automatically. A Cat. II designation also requires the fishery to have an observer program. Fishermen must carry an observer onboard if requested and must comply with any take reduction plans in place. There is currently no take reduction plan in the Gulf of Mexico for bottlenose dolphins. Fishermen are also required to report all incidental injuries and mortalities of marine mammals to the Office of Protected Species. **Louisiana:** There is currently no reporting requirement at the state level for capture of non-fish species in Louisiana.	

[1] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/

[2] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[3] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[4] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[5] "List of Fisheries" *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/interactions/lof/

8.4.3 (a)(iii) - documentation on fish catches ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The SEFSC Fisheries Monitoring Branch monitors the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[1] Landings data are collected from each individual state agency Trip Ticket Reporting Program. NOAA Fisheries has a cooperative agreement with each state and relies on the state to collect and process landings data reported by dealers. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico (refer to 7.1.4(a) for full details on the GSS).[2] Furthermore, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal. ALF forms are mailed to permit holders each spring to report on landings from the previous year.[3]		

Louisiana: Louisiana meets required standards of data collection of fish catches through the Trip Ticket Program. LDWF implemented the Trip Ticket Program for fishery-dependent data collection in 1999.[4] The Trip Ticket Program is a mandatory reporting program for catch data at the trip level reported by dealers on a monthly basis and minimum data required includes: trip date, trip number, vessel ID number, participant ID number, species, quantity landed, landing condition, market size range, ex-vessel value, location landed, dealer ID, transaction date, gear used, and area fished.		

[1] "Fisheries Monitoring Branch" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/data/monitoring.htm

[2] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[3] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[4] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

8.4.3 (b) Is such an observer and inspection scheme being established in order to promote compliance with applicable (fishery management) measures? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
	OBSERVER SCHEME: Amendment 13 of the Shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition. These methods include the implementation of mandatory observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition.[1] Federal gulf shrimp permit holders are required to carry an onboard observer if selected by the SERO to participate in the Galveston Laboratory Observer Program. This requirement is mandated by 50 CFR 622.52 and participation is a condition for annual renewal of federal shrimp permits.[2] Permit holders are selected by the Southeast Regional Director (SRD) through a stratified random sampling method. 50 CFR 622.52 requires any vessel with a Gulf commercial shrimp vessel permit, if selected by the SRD, to carry a NMFS-approved observer and allow the observer free and unobstructed access to the vessel's bridge, working decks, holding bins, weight scales, holds, and any other spaces used to hold, process, weigh or store fish. The Galveston Lab Observer Program consists of onboard monitoring and scientific data analysis of the Gulf of Mexico shrimp fleet with a focus on bycatch characterization and shrimp BRD evaluation. The Observer Program evaluates species composition of shrimp trawl bycatch, and efficacy of TEDs and BRDs.[3]	

Due to the high costs of outfitting boats with observers, NOAA Fisheries determined that 1% coverage would be adequate to document information on bycatch composition in the fishery when the Observer Program was made mandatory by Shrimp FMP Amendment 13.[4] Amendment 13 notes that 5% coverage is typical of standard observer programs; however, the expense of outfitting the Gulf and South Atlantic shrimp fleet at 5% coverage is too cost prohibitive, and given the current economic condition of the fishery, the industry could not be asked to incur the cost. As part of the bycatch data collection methodology set by Amendment 13, the data gathered by observers at the 1% coverage level would then be combined with detailed effort data from the ELB program to extrapolate total bycatch numbers for the fishery. The most recent report from the Galveston Lab Observer Program, published in 2012, indicates that observer coverage is now at about 2% for the Gulf and South Atlantic shrimp fisheries due to decreases in effort in the fishery.[5] Observer coverage through this program only applies to the offshore fleet with federal permits and does not cover inshore state-licensed shrimp otter trawls.
The National Bycatch Report, published by NOAA, considers the Gulf of Mexico shrimp trawl observer coverage to be at a pilot/baseline stage and ranks the fishery as a Tier 2 for bycatch estimation, indicating that methods for obtaining data and estimating bycatch need improvements before being considered reliable.[6]

In 2012, observer coverage was added specifically for the inshore skimmer trawl fishery in the northern Gulf of Mexico due to increased sea turtle stranding reports.[7] The authority to mandate this observer coverage falls under the ESA.[8] Coverage for the skimmer fleet has continued annually since 2012. Reports on the skimmer trawl observer coverage are published annually. The primary objectives were to document interactions with threatened or endangered sea turtles during commercial shrimping operations and to quantify both target and non-target species by area.[9] Coverage is currently low due to difficulties with obtaining accurate contact information for state permit holders, significant changes in the inshore fleet due to economic difficulties (boats sold or not active), lack of vessel insurance (which is a requirement for carrying observers), and difficulty in determining participants based on gear type. In 2014, of the 277 permit holders selected for the program, only 15 vessels carried observers.[10]

The National Bycatch Report, First Edition Update 1, released in 2013, states that observe data from the Gulf of Mexico shrimp skimmer net fishery was not used in the report because the levels of observer coverage are too low to assess bycatch.[11]

There are strong criticisms by some stakeholders, including environmental non-governmental organizations (NGOs), who believe that the current percent coverage is not adequate to ensure compliance with conservation measures and is likely to lead to the "observer effect", where fishermen modify their behavior when observers are present. The National Bycatch Reports also indicate that improvements are needed within the Observer Program to accurately and reliably assess bycatch of the fishery.

INSPECTION SCHEME:
Marine resource laws are enforced by the USCG, NOAA Office of Law

	Enforcement and LDWF. Refer to 7.7.3 for details on inspection authority and activities by each agency.	

[1] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[2] 50 C.F.R. § 622.52 http://www.gpo.gov/fdsys/granule/CFR-2013-title50-vol12/CFR-2013-title50-vol12-sec622-52

[3] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[4] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[5] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[6] National Marine Fisheries Service. 2011. *U.S. National Bycatch Report* [W. A. Karp, L. L. Desfosse, S. G. Brooke, Editors]. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-117C. http://www.nmfs.noaa.gov/by_catch/BREP2011/2011_National_Bycatch_Report.pdf

[7] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[8] Federal Register- Annual determination to implement observer coverage https://www.federalregister.gov/articles/2015/03/19/2015-06341/2015-annual-determination-to-implement-the-sea-turtle-observer-requirement

[9] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[10] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[11] National Marine Fisheries Service. 2013. *U.S. National Bycatch Report First Edition Update 1* [L. R. Benaka, C. Rilling, E. E. Seney, and H. Winarsoo, Editors]. U.S. Dep. Commerce. http://www.st.nmfs.noaa.gov/Assets/Observer-Program/bycatch-report/NBR_FirstEditionUpdate1.pdf

8.4.4 Is the adoption of appropriate technology being promoted taking into account economic conditions for the best use and care of the retained catch? ***Yes...***[1] ***Some...***[½] ***No...***[0]

Extent of compliance		
Yes	**Some**	**No**
The Unites States Code, Title 21, Part 123 and Part 110 establish a mandatory seafood inspection program, Hazard Analysis and Critical Control Points (HACCP), and quality standards for the manufacture, packing and storing of food for human consumption.[1,2] The FDA maintains a Science and Research (Food) Program that continues to advance knowledge regarding best practices for handling and preparation, and consumer use of foods, including seafood.[3] At the state level, the Louisiana Department of Health and Hospitals (LDHH) Commercial Seafood Program is the regulatory and enforcement agency for all seafood products produced and processed in Louisiana.[4] LDHH conducts inspections of seafood facilities to ensure that HACCP and National Shellfish Sanitation Program (NSSP) quality standards and requirements are being met. The LFF Program, a partnership between LDWF and Louisiana Sea Grant, provide education and training to seafood harvesters, dealers, and processors on best practices for handling seafood and regulations set by the FDA and other agencies.[5]		

[1] 21 U.S.C. 123 (FDA HACCP regulations) http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=123

[2] 21 U.S.C. Part 110 (Federal Food, Drug and Cosmetics Act) http://www.gpo.gov/fdsys/pkg/USCODE-2011-title21/html/USCODE-2011-title21-chap9-subchapIV.htm

[3] "Science and Research (Food)" *U.S. Food and Drug Administration.* Web. Accessed November 2015. http://www.fda.gov/Food/FoodScienceResearch/default.htm

[4] "Commercial Seafood Program" *Louisiana Department of Health and Hospitals.* Web. Accessed November 2015. http://www.dhh.state.la.us/index.cfm/page/444/n/207

[5] *Louisiana Fisheries Forward*. Web. Accessed December 2015. http://lafisheriesforward.org/

8.4.5 Are States and relevant groups from the fishing industry encouraging the development and implementation of technologies and operational methods that reduce discards?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The primary gear types in the Louisiana commercial shrimp fishery are otter trawls, skimmer trawls and butterfly nets; cast nets are also sometimes utilized but documentation of this gear time is low.[1] Otter trawls are the dominant gear in the offshore fleet; skimmers have become popular in inshore waters. Federal regulations require the use of TED is all otter trawls in state and federal waters. Skimmer trawls are required to either use a TED in each net, or adhere to strict maximum tow times to prevent drowning of incidentally captured sea turtles. Trawls are also required to use BRDs in federal waters in depths from 10 to 100 fathoms.		

TEDs:
Federal regulations require the use of TEDs in all otter trawls in the shrimp fishery in both state and federal waters to reduce sea turtle capture and mortality.[2] Federal regulations requiring TEDs in all otter trawls for the shrimp fishery went into effect in 1989. TEDs are not 100% effective; certified TED designs are required to meet a 97% efficiency rate for turtle exclusion within a five minute period. Current certified TEDs in use; therefore, are effective in allowing the escape of most turtles caught within shrimp trawls. Federal regulations require either the use of a TED in skimmer nets, or adherence to strict tow times (maximum 55 minutes from April 1 to October 31, and 75 minutes from November 1 to March 31) to reduce sea turtle capture and drowning within skimmer nets. In 2012, NOAA proposed a regulation change requiring the use of TEDs in skimmers; however, research indicated that the majority of turtles (58%) captured in skimmer trawls during observer coverage in 2012 were small enough to pass through the current 4" TED design.[3] These data caused NOAA to repeal the proposed rule over concern that current TEDs would not efficiently exclude turtles caught using skimmers in the inshore fleet and NOAA began research on new TED designs to address this problem. NOAA is currently actively researching new TED designs to exclude smaller turtles, and outreach efforts have begun to increase awareness of tow time regulations to improve compliance with the current tow time regulations. Some fishermen in the skimmer trawl fleet in Louisiana do use TEDs voluntarily.

BRDs:
The U.S. Code of Federal Regulations also requires shrimp trawl vessels to be equipped with a certified BRD installed in each net used for fishing on their vessel.[4] To be certified by the NOAA Harvesting Systems Unit, a BRD must reduce finfish bycatch by at least 30% by weight.[5]

BRDs are not required in state waters in Louisiana; however, many fishermen utilize BRDs to reduce catch of unwanted species.

NOAA Harvesting Systems Unit:
The SEFSC Pascagoula Lab contains the Harvesting Systems Unit, which is a team of gear specialists and fishery biologists performing research into critical problems relating to commercial and recreational fishing gear to inform and improve fisheries resource management.[6] The Harvest Systems Unit is responsible for the development, evaluation, certification, and national and international technology transfer of TEDs for trawling gear. The Harvesting Systems Unit is also responsible for the development and assessment of BRDs to reduce finfish bycatch in shrimp trawls. Research on TEDs and BRDs for the shrimp fishery is ongoing with annual testing on new designs of these devices to improve efficiency in reducing bycatch and minimizing shrimp loss and studies are conducted both independently, and in collaboration with commercial shrimpers through cooperative research projects. There are currently several certified designs of both TEDs and BRDs approved by the NOAA.[7,8] Harvesting Systems Unit also contains a Gear Monitoring Team (GMT) dedicated to outreach and education on TED and

BRD regulations and use. The GMT conduct courtesy inspections of TEDs and BRDs installed on shrimp boats during dock visits, workshops and upon request to ensure that these devices are properly used and may focus on areas of higher non-compliance based on past boarding records.[9] The GMT coordinator's contact information is also published on NOAA's SEFSC's website and he can be contacted directly to do dockside inspections with no penalty attached prior to a vessel's departure.[10] Additionally, Texas Sea Grant gear specialists have been active in training fishermen and captains across the Gulf of Mexico in all five states on TED and BRD use and other gear design improvements. In 2014, as part of a grant from the NFWF, a marine extension agent and a marine fisheries specialist traveled to conduct dockside inspections, reaching 500 captains and crewmembers.[11] The Gulf and South Atlantic Fisheries Foundation is a private, regional nonprofit research and development organization focused on the development of commercial fisheries in the South Atlantic and Gulf of Mexico. The foundation has been active hosting workshops for commercial fishermen for at least 30 years. Efforts focused on TED and BRD research and development and gear outreach have been deemed successful by NMFS and the Foundation.[12] The most recent outreach efforts by the Foundation were from 2011-2013. In that time period, the Regional Coordinators for the project traveled to 8 States in the Gulf and South Atlantic, visiting 74 cities. Regional Coordinators disseminated TED and BRD instruction manuals in English, Spanish, and Vietnamese. Additionally, TEDs were inspected according to the NOAA Boarding Form to check for any non-compliances while boats were still at the dock and could address any issues.		

[1] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[2] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[3] Elizabeth Scott-Denton, Jo Williams, and Jeffrey Pulver "Observer Coverage of the 2014 Gulf of Mexico Skimmer Trawl Fishery" NOAA Technical Memorandum NMFS-SEFSC-666 (2014) http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/2014_skimmer_trawl_observer_report.pdf

[4] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[5] GMFMC. *Amendment 10 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2002. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-10%20Final%202002-07.pdf

[6] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[7] "TED Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/designs.htm

[8] "BRD Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/brd/designs.htm

[9] NOAA Fisheries. *Southeast Fishery Bulletin*. February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[10] "Sea Turtle Staff" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/turtles/staff.htm

[11] *Texas Sea Grant*. Web. Accessed November 2015. http://texasseagrant.org/staff/tony-reisinger/

[12] Helies, F.C. Graham, G., Parker, L., Jamison J. 2013. An Expanded Outreach Program and Technology Transfer of Updated Bycatch Reduction Devices and Turtle Excluder Devices to the Southeastern U.S. Shrimp Industry. Final Report. http://www.gulfsouthfoundation.org/uploads/reports/118_final_report.pdf

8.4.6 Are technologies, materials and operational methods being applied that minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Technologies, materials and methods are being applied by state and federal agencies to minimize the loss of fishing gear and effects of ghost fishing by lost or abandoned gear. Refer to 7.2.2 (g)(ii) response for full details of actions and regulations being taken by each agency.		

8.4.7 Are assessments being carried out of the implications of habitat disturbance prior to the introduction on a commercial scale of new fishing gear, methods and operations?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC website Fishing Regulations section lists allowable gear for each fishery. Allowable gear for the Gulf of Mexico commercial shrimp fishery includes otter trawl, skimmer trawl, butterfly net and cast net.[1] NOAA's Harvesting Systems Unit, housed at the Pascagoula Lab in Mississippi, is a team of biologists and gear specialists who perform critical research on fishing gear. The Harvesting Systems Unit does extensive research on fishing gear, methods, BRDs, and TEDs for the Gulf of Mexico shrimp fishery, including cooperative research with commercial industry members to test improved gear designs and methods.[2] All gear designs tested by the harvesting systems unit are fully evaluated for impacts. Additionally, any changes in allowable gear would go through the regulatory process, which requires an environmental assessment prior to implementation as required by NEPA and the MSA Section 304(i).[3] **Louisiana:** Commercial harvest of shrimp is only allowed with a valid commercial shrimp gear		

license and only with specified gear types. Current gear allowed for shrimping in Louisiana are otter trawls, skimmer trawls, butterfly nets and cast nets.[4] Changes to gear type of harvest methods for the shrimp fishery would be required to go through the regulatory process and would require evaluation before implementation. The Secretary of LDWF is responsible for issuing permits to person interested in the development of new gear under Louisiana Revised Statutes 56:571(B).[5] Applications submitted to the Secretary are rigorously reviewed by LDWF and any authorized permits are closely monitored.		

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[3] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[4] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

[5] La. R.S. 56:571 https://legis.la.gov/Legis/Law.aspx?d=105397

8.4.8 Is research being promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities, being promoted?

(i) - on the environmental impacts? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The EFH Generic Amendment (applied to all Gulf of Mexico FMPs) and accompanying EIS contain detailed information on the environmental impacts of fishing methods.[1,2] Section 6.1.2.1 of the amendment specifically pertains to impacts from trawl fisheries as does section 3.5.2 of the EIS. The EFH amendment also makes recommendations for minimizing impacts, which have been adopted by the GMFMC. Changes in allowable gear type would occur through amendment of the Shrimp FMP and federal regulations. NEPA requires the analysis of any potentially significant environmental impacts that may result from new regulations or agency actions by all federal government agencies. Section 304(i) of MSA requires compliance with NEPA regulations with regard to fishery management plans and actions.[3] NOAA Fisheries determines the analysis level necessary to comply with MSA and NEPA regulations for each FMP amendment and management action. A summary of findings is compiled in either a Record of Decision or a Finding of No Significant Impact (FONSI) which is included in each FMP or amendment. For the		

Shrimp FMP, an EIS or an EA has been conducted for each amendment as necessary.[4] Additionally, Section 303 (a)(9) of the MSA requires that FMPs include a FIS for the plan or amendment. The FIS includes an assessment of the likely biological, social, economic, and administrative effects, if any, of the conservation and management measures on fishery participants and their communities as well as participants in other fisheries conducted in adjacent areas.[5]		

[1] GMFMC. *Generic Amendment for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 1998. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/FINALEFH-%20Amendment%201-%20no%20appendices.pdf

[2] GMFMC. Final Environmental Impact Statement *Generic Amendment for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery, Red Drum, Reef Fish, Coastal Migratory Pelagic Resources, Stone Crab, Spiny Lobster, and Coral*. 2004. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20EFH%20EIS.pdf

[3] "National Environmental Policy Act Requirements" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/msa/nepa.html

[4] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[5] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

8.4.8 (ii) - on the social impacts? **Yes...**[1]**Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
<u>Federal</u>: NOAA SEFSC conducts an Annual Economic Survey of Federal Gulf Shrimp Permit Holders each spring collecting data on operating expenses and costs associated with owning and maintaining shrimp vessels.[1] Each year a third of the permit holders are randomly selected for this survey and information is used to assess trends in the financial state of the fishery, social and economic effects of regulations, and other economic factors impacting the Gulf shrimp fishery. NOAA SEFSC also contains a SSRG that conducts applied research on socio-cultural aspects of marine resources in the Gulf of Mexico.[2] This research largely focuses on participant and community dependence and engagement in fisheries and is directed by the principles of the MSA NS8:[3] - *Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of*		

such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities. Changes in allowable gear type would occur through amendment of the Shrimp FMP and federal regulations. Section 303 (a)(9) of the MSA requires that FMPs include a FIS for the plan or amendment. The FIS includes an assessment of the likely biological, social, economic, and administrative effects, if any, of the conservation and management measures on fishery participants and their communities as well as participants in other fisheries conducted in adjacent areas.[4] The GMFMC Shrimp FMP contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a RIR.[5] NOAA Fisheries also requires a RIR for each regulatory action of public interest, which provides a review of the level and incidence of impacts associated with the action, a review of the problems and policies prompting the action, and ensures that the agency has comprehensively considered all alternatives.[6] All amendments and regulatory actions also go through public hearings and comment periods prior to implementation, which provides opportunity for additional input from industry members regarding potential impacts. **<u>Louisiana</u>:** Similarly, changes in regulations relating to gear or method of take for the Louisiana shrimp fishery must go through the regulatory process for approval. LDWF consults with the Louisiana STF and conducts direct stakeholder communications, public hearings, and provides public comment opportunities to address socioeconomic aspects of potential regulation changes.[7,8] If any change in management is put before the LWFC, including adoption of alternative management measures that would affect members of the shrimp industry, a Fiscal and Economic Impact Statement must be prepared to summarize potential economic and social effects, and what costs could be incurred by the change.[9]		

[1] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[2] "Social Science Research Group" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[3] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[4] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[5] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[6] "Guidance for Conducting Economic and Social Analyses of Regulatory Actions. *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/sfa/laws_policies/economic_social/index.html

[7] "Shrimp Task Force" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/shrimp-task-force

[8] "Action Items" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/action-items

[9] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.54 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

8.4.8 (iii) - on the impact on biodiversity? **Yes...**[1]**Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
There are two overarching considerations for the Louisiana shrimp fishery with regard to conservation of biodiversity of ecosystems: bycatch and bottom habitat impacts. Research is being conducted at federal and state levels to monitor and assess potential impacts. **<u>BYCATCH:</u>** Bycatch is a major concern in shrimp fisheries globally. A FAO report on fishery discards (Kelleher 2005) indicates that, world-wide, shrimp trawl fisheries have both the highest discard rate and volume of all fisheries.[1] This report also notes that warm-water shrimp trawl fisheries typically have significantly higher proportions of bycatch (average: 75% of total catch), than cold-water fisheries (average: 10% of total catch). Environmental impacts associated with bycatch include depletion of species typically caught as bycatch, which may include species that are listed as protected, endangered, or threatened (PET), and alterations of the food web such as trophic cascades. Managers and shrimp fishermen throughout the Gulf of Mexico have cooperated to develop and utilize best-practices for bycatch reduction and have made substantial progress in minimizing bycatch impacts. Collaboration is ongoing to develop innovative methods to further address bycatch concerns. NOAA Fisheries National Bycatch Report acknowledges the improvements made to the Gulf of Mexico shrimp fishery and also provides suggestions for additional improvement to research and monitoring.[2] Similarly, the Louisiana Shrimp FMP identifies general bycatch and incidental capture of sea turtles as ongoing issues in the fishery and presents options for research and management consideration.[3] Promoting consistency with the ESA and MMPA, and minimizing incidental capture of finfish species are two major objectives of the GMFMC Shrimp FMP.[4] Amendment 13 of the Shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition.[5] These methods include the implementation of an ELB for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition. The NOAA SEFSC Galveston Lab focuses research efforts on Fishery Management, Fishery Ecology and Protected Species with strong emphasis on		

research pertaining to all aspects of the shrimp fishery.[6] Data are collected on the shrimp fishery through the ELB Program and the Observer Program managed by the Galveston Lab. The ELB program began in 2007 and transferred to the cELB program in 2014.[7] If selected, Gulf shrimp permit holders are required to participate in the program and permit renewal is contingent upon participation. The ELB program collects data on amount and location of shrimp landings. Gulf shrimp permit holders are also required to carry an observer if selected for the Galveston Laboratory Observer Program, which also became mandatory in 2007. Similar to the ELB program, permit holders are selected by the Southeast Regional Director through a stratified random sampling method. The focus of data collection for the shrimp fishery observer program is bycatch and BRD evaluation.[8] The Observer Program evaluates TEDs and BRDs, quantifies bycatch and characterizes bycatch species composition. The Galveston Lab regularly publishes research on the shrimp fishery and contributes data and research results to the National Observer Program, which also produces reports biannually. Bycatch data from the observer and ELB programs is also utilized by the SEDAR process when conducting stock assessments of other species.[9]

The most recent report on shrimp otter trawl bycatch (Scott-Denton et al. 2012) from the Galveston Lab determined that total bycatch to shrimp ratio had decreased to 2.5:1 for total bycatch to shrimp and 2:1 for finfish to shrimp.[10] Characterization of bycatch composition from this report shows that the majority of species are finfish, but some crustaceans including blue crabs and other shrimp species like seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*), and sea turtles are also known bycatch species.[11] This bycatch species composition is consistent with other shrimp trawl bycatch studies conducted within the Gulf of Mexico (Adkins, 1993 in Louisiana, Burrage 2002 in Mississippi, and Fuls et. al 2002 in Texas). Based on a recent analysis by Raborn et al. (2014) the only species (or species group) that represent 5% or higher in shrimp trawl bycatch are Atlantic croaker, Seatrouts, longspine porgy, and inshore lizardfish and analysis of these species indicates that shrimp trawl bycatch does not pose a threat to the populations of these species.[12]

The initial NOAA National Bycatch Report, published in 2011, indicated that the fishery bycatch ratio (ratio of the total fishery bycatch to total fishery catch) for the Gulf of Mexico shrimp fishery was .76, the highest of all U.S. fisheries analyzed in the report (some fisheries were data-deficient and could not be included- such as the South Atlantic shrimp trawl fishery).[13] The 2013 update to the National Bycatch Report indicates that improvements in bycatch estimation and bycatch reduction in the Gulf of Mexico shrimp trawl fishery have resulted in the reduction of the fishery bycatch ratio from .76 to .63.[14]

One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the ESA, which includes five species of sea turtles, smalltooth sawfish, and Gulf sturgeon.[15] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. USFWS and NOAA Office of Protected Resources are responsible for research and assessment of species on the endangered species list

and assessments and recovery plans are updated every five years.[16] NOAA is also required to consult on activities that may impact endangered species and has produced several Biological Opinions relating to sea turtles and the shrimp trawl fishery in the Gulf of Mexico. The most recent biological opinion was published in 2014 and authorizes the continued operation of the shrimp trawl fishery.[17] A new consultation (resulting in a biological opinion) is initiated if there is new information or an action is modified that has not previously been considered, or if an incidental take statement is exceeded.

The Pascagoula Lab in Mississippi houses the Harvesting Systems Unit, a team of biologists and gear specialists who perform critical research on fishing gear. The Harvesting Systems Unit does extensive research on BRDs for the Gulf of Mexico shrimp fishery, including cooperative research with commercial industry members to test improved gear designs, and also conducts trainings and courtesy inspections across the Gulf on commercial shrimp boats to ensure proper use of TEDs and BRDs.[18] Current research being conducted by the Harvesting Systems Unit includes new TED designs for use in skimmer trawls.

BOTTOM HABITAT IMPACTS:

Impacts on EFH are assessed by NOAA and the GMFMC in the Generic Amendment for addressing EFH requirements in FMPs. The EFH amendment applies to all seven GMFMC FMPs.[19] The Initial EFH amendment was developed in 1998 and included an EIS. Section 5.1 identifies EFH for the shrimp species managed in the Gulf of Mexico Shrimp FMP (brown, white, pink, and royal red). Section 6.1 identifies fishing-related threats, 6.2 identifies non-fishing related threats. Section 7 provides management options to minimize impacts and Section 8 identifies research needs. The EFH amendment is updated every five years.

[1] Kelleher, Kieran. *Discards in the world's marine fisheries: an update*. No. 470. Food & Agriculture Org., 2005. http://www.fao.org/docrep/008/y5936e/y5936e00.htm

[2] National Marine Fisheries Service. 2011. *U.S. National Bycatch Report* [W. A. Karp, L. L. Desfosse, S. G. Brooke, Editors]. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-117C. http://www.nmfs.noaa.gov/by_catch/BREP2011/2011_National_Bycatch_Report.pdf

[3] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[4] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[5] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[6] "Research" Sou*theast Fisheries Science Center, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/research_home/index.html

[7] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[8] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[9] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[10] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[11] National Marine Fisheries Service, 2011.

[12] Raborn et al. 2014 characterization of bycatch in shrimp trawl fishery https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[13] National Marine Fisheries Service, 2011.

[14] National Marine Fisheries Service. 2013. U.S. National Bycatch Report First Edition Update 1 [L. R. Benaka, C. Rilling, E. E. Seney, and H. Winarsoo, Editors]. U.S. Dep. Commerce. https://www.st.nmfs.noaa.gov/Assets/Observer-Program/bycatch-report/NBR_FirstEditionUpdate1.pdf

[15] NMFS. 2012. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/fisheries_bo/southeastshrimpbiop_final.pdf

[16] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[17] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[18] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[19] "Essential Fish Habitat Amendments" *Gulf of Mexico Fishery Management Council*. Web. Accessed November. 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

8.4.8 (iv) - on the impact on coastal fisheries? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The original Shrimp FMP implemented in 1981 identified several areas of user		

conflicts both with direct use of shrimp resources and with other marine resource users.[1] Direct users include recreational, live-bait, and commercial harvesters and both inshore and offshore fleets.

- Conflicts have arisen between direct users over preferred size of harvest. Some users prefer smaller shrimp typically harvested inshore, especially for the live-bait industry; however, offshore vessels harvest larger shrimp for food consumption. Most states have developed seasons for harvest of shrimp designed to accommodate multiple user needs. Additionally, area and seasonal closures (Texas closure and Tortugas closure) have also been set for federal waters to allow for protection of smaller shrimp in some areas until they reach a larger size. In Louisiana, the inshore shrimp season for commercial and recreational harvest is based on shrimp size. LDWF sampling each year determines when shrimp have reached marketable size and LWFC opens the season based on biological sampling and input by the shrimp industry.[2] Other states have similar regulations.[3]

Conflicts with other fisheries and user groups have also been identified.

- Red snapper bycatch has been a major concern in the Gulf of Mexico shrimp fishery in the past. The Red Snapper fishery in the Gulf of Mexico is considered overfished and is in a rebuilding plan.[4] The red snapper rebuilding plan included a significant reduction in juvenile red snapper bycatch in the Gulf of Mexico shrimp Fishery. Amendment 9 of the Shrimp FMP focused on reducing bycatch of juvenile red snapper in age 0 and age 1 groups by 50%, which was the amount determined at the time by NOAA Fisheries as necessary for the rebuilding plan.[5] Amendment 9 required the use of BRDs in shrimp trawls west of Cape San Blas, FL in the U.S. EEZ. East of Cape San Blas was exempt at the time due to low abundance of red snapper in this area, and state waters were not considered a factor because it was determined that juvenile red snapper typically occur beyond depths of five fathoms, and mainly occurred beyond 10 fathoms (80-83% occurrence below 10 fathoms).[6] The BRD certification criteria were changed by an August 2006 Regulatory Amendment to require that total finfish reduction be reduced by 30% with no specific red snapper requirement.[7] In 2007, Amendment 14 (effective in 2008) established a specific red snapper bycatch reduction target for the shrimp fishery and designated seasonal closure restrictions that could be used to manage shrimp fishing effort in relation to the target bycatch reduction goal.[8] If it is determined that a seasonal closure is necessary, then the Regional Administrator will set the closed season area and duration as necessary to meet the bycatch reduction target. Bycatch reduction target for juvenile red snapper in the shrimp fishery have been meet and exceeded through use of BRDs and significant reductions in shrimp effort.[9]
- High incidental catch of finfish and shellfish has also created conflicts between shrimpers and the northern Gulf of Mexico groundfish fishery that may utilize species discarded by the shrimp fishery. Juvenile

	groundfish and other species are typically not retained by shrimpers because there is low economic value for them and retaining them would reduce available space for retaining shrimp catch. Regulations developed to reduce bycatch including required BRDs have significantly decreased bycatch of finfish within the shrimp fishery and additional actions, including effort reductions and seasonal closures (if needed) have also helped in reducing bycatch.[10,11] - Gear conflicts between shrimpers and stone crab fishermen. The GMFMC Shrimp FMP directly addresses conflicts between the shrimp and stone crab fisheries and established five zones within the EEZ to separate shrimp trawling and stone crab trap activity.[12] - Gear conflicts also occur in state waters between shrimpers and blue crab fishermen. Each of the five Gulf states, including Louisiana, have established trap identification and visibility requirements, restrictions on harvest hours, seasonal and area closures and derelict trap removal programs, which reduce interactions between trawls and crab traps.[13,14]		

[1] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[3] GSMFC. *Law Summary 2015.* http://www.gsmfc.org/publications/GSMFC%20Number%20245.pdf

[4] "Red Snapper" *FishWatch*. Web. Accessed June 2015. http://www.fishwatch.gov/seafood_profiles/species/snapper/species_pages/red_snapper.htm

[5] GMFMC. *Amendment 9 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 1997. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-09%20Final%201997-02.pdf

[6] Nichols, Scott. *The spatial and temporal distribution of the bycatch of red snapper by the shrimp fishery in the offshore waters of the US Gulf of Mexico*. Pascagoula, Mississippi: National Marine Fisheries Service, Mississippi Laboratories, 1990.

[7] GMFMC. *A Framework Measures to Address the Bycatch Reduction Criterion for Shrimp Trawls in the Gulf of Mexico West of Cape San Blas, Florida Under the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico*. 2006 http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/shrimp/archives/shrimp_reg_amend_aug_2006.pdf

[8] GMFMC. *Amendment 14 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20RF%20Amend%2027-%20Shrimp%20Amend%2014.pdf

[9] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[10] 50 C.F.R. § 622 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_156

[11] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[12]GMFMC Shrimp FMP Amendment 3
http://gulfcouncil.org/fishery_management_plans/shrimp_management.php

[13] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015.
http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[14] Derelict Trap Task Force. 2008. Guidelines for Developing Derelict Trap Removal Programs in the Gulf of Mexico. Gulf States Marine Fisheries Commission. Ocean Springs, MS.
http://www.gsmfc.org/publications/GSMFC%20Number%20154.pdf

8.5 Fishing gear selectivity

8.5.1 (a) Where practicable, is there a requirement that fishing gear, methods and practices are sufficiently selective as to minimize waste, discards, catch of non-target species - both fish and non-fish species - and impacts on associated or dependent species and that the intent of related regulations is not circumvented by technical devices and that information on new developments and requirements is made available to all fishers? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
	The primary gear types in the Louisiana commercial shrimp fishery are otter trawls, skimmer trawls, and butterfly nets.[1] There is occasional use of cast nets, but documentation of catch with this gear is very small and chopstick nets were banned in both inshore and offshore waters in Louisiana in 1984.[2] There are two overarching considerations for the Louisiana shrimp fishery with regard to gear selectivity and environmental impacts: bycatch and bottom habitat impacts. Fishermen and managers in the Gulf Of Mexico work collaboratively on innovative gear modifications to reduce impacts. TEDs are required in otter trawls in state and federal waters by federal regulations, and tow time limits are required for skimmer trawls and butterfly nets.[3] The use of BRDs is required in federal waters and encouraged in state waters, but not required.[4] Substantial progress has been made in minimizing bycatch and impacts to the ecosystem by the Louisiana shrimp fishery; however, some areas for potential improvements remain.[5] Refer to the response to 7.2.2 (g)(iii) for full details on gear selectivity for each allowable gear type.	

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015.
http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. page 23.
http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[3] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[4] 50 C.F.R. § 622.53 http://www.ecfr.gov/cgi-bin/text-idx?SID=86d3e4e21c5c4a3cd94b7f259d8700e1&node=50:12.0.1.1.2&rgn=div5#se50.12.622_153

[5] National Marine Fisheries Service. 2013. *U.S. National Bycatch Report First Edition Update 1* [L. R. Benaka, C. Rilling, E. E. Seney, and H. Winarsoo, Editors]. U.S. Dep. Commerce. http://www.st.nmfs.noaa.gov/Assets/Observer-Program/bycatch-report/NBR_FirstEditionUpdate1.pdf

(8.5.1 (a) cont.)

- Are regulatory measures being circumvented by technical devices?

Yes...[0] **Some...**[½] **No...**[1]

Extent of compliance		
No	**Some**	**Yes**
Federal: Section 311 of the MSA authorizes NOAA enforcement and USCG agents to "*board, and search or inspect, any fishing vessel which is subject to the provisions of this Act*" with or without a warrant.[1] Both the USCG and NOAA Office of Law Enforcement actively monitor and enforce all federal fishing regulations including inspections to ensure proper use of gear such as TEDs and BRDs.[2,3] TED compliance is a particular focus for enforcement officers and TED compliance reports are compiled and analyzed quarterly to ensure that the fishery continues to meet minimum compliance required by the ESA.[4] Penalties for TED violations are based on the level of violation (Level 1=minor, Level 4=most severe) and penalties can be severe, ranging from a few hundred dollars to several thousand, forfeiture of catch and possible jail time. Additionally, authorization for the continued operation of the Gulf of Mexico shrimp fishery is based on maintaining compliance with TED regulations and the fishery can be close for a period of 30 days if TED compliance drops below the threshold of minimum compliance for two consecutive quarters.[5] These policies typically deter fishermen from circumventing regulatory measures. **Louisiana:** LDWF enforcement agents conduct on water and dockside inspections and responds to reports of violations, issuing citations for any violation of gear regulations. LDWF Enforcement agents actively monitor and enforce fishery regulations. In FY 2013-14, LDWF/LED conducted over 292,000 patrol hours, of which 207,510 were land-based and 84,521 were on the water. There were 732,881 documented contacts by agents with the public and agents issued 12,551 criminal citations and 5,020 warnings and the most common types of citations were fishing without a license, failure to comply with personal flotation device requirements, not abiding by rules and regulations on WMAs, and failure to comply with harvest record regulations.[6] The Louisiana STF website contains an LDWF Enforcement Report with statistics specific to shrimp violations. Between 2002-2012, the number of shrimp violations ranged from 69 to 206 per year, with an average of 137 violations per year and the most common violations were shrimping in closed seasons or areas.[7] The Louisiana Shrimp FMP, Appendix V also provides NOAA		

and USCG enforcement data on TED compliance broken down by state and indicates that the Louisiana shrimp fleet is being actively monitored and maintaining compliance with TED/BRD regulations.[8]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "Office of Law Enforcement" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/ole/

[3] "Living Marine Resources" *United States Coast Guard*. Web. Accessed November 2015. http://www.uscg.mil/hq/cg5/cg531/LMR.asp

[4] NOAA Fisheries. TED Effectiveness Rates (April 2014 - July 2015). http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/sea_turtle_capture_rates_and_ted_effectiveness_in_the_southeast_shrimp_otter_trawl_fleet.pdf

[5] NOAA Fisheries. *Turtle Excluder Device (TED) Compliance Policy*. Draft May 2015. http://sero.nmfs.noaa.gov/protected_resources/sea_turtle_protection_and_shrimp_fisheries/documents/ted_compliance_policy.pdf

[6] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

[7] LDWF. *Enforcement Report*. August 2013. http://www.wlf.louisiana.gov/sites/default/files/pdf/document/36907-louisiana-shrimp-fishery-improvement-plan-ldwf-enforcement-report/enforcement_report-final_8-1-13.pdf

[8] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Pages 104-105. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

8.5.1 (b) Are fishers cooperating in the development of selective fishing gear and methods? **Yes...**[1] **Sometimes...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA Fisheries SERO Cooperative Research Program (CRP) is a competitive federal assistance program that funds projects seeking to increase and improve the working relationship between researchers from NOAA Fisheries, state fishery agencies, universities, and fishermen. The CRP has as its principal goal to provide a means of involving commercial and recreational fishermen in the collection of fundamental fisheries information to support the development and evaluation of management and regulatory options. Past research projects have included gear testing for BRDs and TEDs with commercial shrimp industry participants.[2] NOAA SEFSC Harvesting Systems Unit often collaborates with commercial fishermen on research of new gear designs.[3] Texas Sea Grant has also been active in research of various gear designs including		

TEDs, BRDs and trawl door fuel efficiency testing with fishermen and captains across the Gulf of Mexico.[4] The Gulf and South Atlantic Fisheries Foundation (GSAFF) is a private, regional nonprofit research and development organization focused on the development of commercial fisheries in the South Atlantic and Gulf of Mexico.[5] The foundation has been actively working with commercial fishermen for at least 30 years conducting cooperative research and hosting workshops and training opportunities. Efforts focused on in TED and BRD research and development and gear outreach have been deemed successful by NOAA Fisheries and the Foundation.[6,7]		

[1]NOAA Fisheries SERO. CRP program
http://sero.nmfs.noaa.gov/operations_management_information_services/state_federal_liaison_branch/crp/index.html

[2] NOAA Fisheries SERO. CRP Award Status Report.
http://sero.nmfs.noaa.gov/operations_management_information_services/state_federal_liaison_branch/documents/2013_crp_annual_report.pdf

[3] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015.
http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[4] *Texas Sea Grant*. Web. Accessed November 2015. http://texasseagrant.org/staff/gary-graham/

[5] "Research" *Gulf and South Atlantic Fisheries Foundation*. Web. Accessed November 2015.
http://www.gulfsouthfoundation.org/research/

[6] GSAFF. *Gulf and South Atlantic News, Volume 16*, Issue (May 2015)
http://gulfsouth.ehclients.com/uploads/newsletters/5_15newsletter_short.pdf

[7] Helies, F.C. Graham, G., Parker, L., Jamison J. 2013. *An Expanded Outreach Program and Technology Transfer of Updated Bycatch Reduction Devices and Turtle Excluder Devices to the Southeastern U.S. Shrimp Industry*. Final Report. http://www.gulfsouthfoundation.org/uploads/reports/118_final_report.pdf

8.5.2 Do regulations governing the selectivity of fishing gear take into account the range of fishing gear, methods and strategies available to the industry? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: Federal regulations allow for several gear types in the Gulf of Mexico shrimp fishery, including otter trawl, butterfly net, skimmer trawl and cast net.[1] Regulations concerning TED use are specific to gear type in order to accommodate differences in design and use.[2] NOAA SEFSC Harvesting Systems Unit continues to research new designs for TEDs and BRDs specific to each gear type in efforts to further improve bycatch reduction and frequently tests and certifies new designs requested by industry members to expand the available options for BRDs.[3] **Louisiana:** Similarly, LDWF allows for various gear types within the inshore shrimp fishery including otter trawls, skimmer trawls, butterfly nets, and cast nets. Gear regulations		

and restrictions are specific to gear type including closure areas for certain gears and size restrictions on trawl nets.[4]		

[1] "Allowable Gear" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishing_regulations/allowable_gear.php

[2] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[3] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[4] LDWF. *Louisiana Commercial Fishing Regulations, 2015.* http://www.wlf.louisiana.gov/sites/default/files/pdf/page/38127-commerical-regulations/2015commercialfishinglowres.pdf

8.5.3 Are States and relevant institutions involved in the fishery collaborating in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA SEFSC Pascagoula Lab houses the Harvesting Systems Unit, a team of biologists and gear specialists who perform critical research on fishing gear. The Harvesting Systems Unit does extensive research on BRDs for the Gulf of Mexico shrimp fishery, including cooperative research with commercial industry members to test improved gear designs, and also conducts trainings and courtesy inspections across the Gulf on commercial shrimp boats to ensure proper use of TEDs and BRDs.[1] Harvesting Systems Unit also contains a Gear Monitoring Team (GMT) dedicated to outreach and education on TED and BRD regulations and use. The GMT conduct courtesy inspections of TEDs and BRDs installed on shrimp boats during dock visits, workshops and upon request to ensure that these devices are properly used.[2] The GMT travels to all five Gulf states to ensure technology transfer; additionally, the Harvesting Systems Unit is responsible for technology transfer of TEDs internationally and conducts trainings and inspections of shrimp fleets throughout the world.[3] NOAA developed a standard TED enforcement boarding form, which is used by each state agency, NOAA enforcement and USCG to inspect TEDs.[4] The August 2006 Regulatory Amendment of the Shrimp FMP standardizes the requirements for certification of BRDs.[5]		

[1] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[2] NOAA Fisheries. *Southeast Fishery Bulletin*. February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[3] 'Shrimp Import Legislation for Sea Turtle Conservation" *NOAA Fisheries.* Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/turtles/shrimp.htm

[4] MDMR Shrimp and Crab Bureau. *Shrimping the Sound*. Spring 2014. Newsletter http://dmr.ms.gov/images/publications/newsletters/Shrimp-Spring-2014.pdf

[5] GMFMC. *A Framework Measures to Address the Bycatch Reduction Criterion for Shrimp Trawls in the Gulf of Mexico West of Cape San Blas, Florida Under the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico*. 2006
http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/shrimp/archives/shrimp_reg_amend_aug_2006.pdf

8.5.4 Is cooperation being encouraged with respect to research program for fishing gear selectivity and fishing methods and strategies, dissemination of the results of such research programs and the transfer of technology? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA SERO disseminates information and results of research through the Southeast Fishery Bulletin.[1] LDWF distributes information through a variety of resources including their website, print material, news outlets, social media, and trainings through the LFF Program. Information distributed includes data from fisheries independent sampling, maps of shrimping grounds, seafood safety, license information, and regulation updates.[2] NOAA, in addition to being responsible for enforcement of TEDs, also has a Gear Monitoring Team (GMT) dedicated to outreach and education on TED regulations. The GMT may conduct targeted to areas of non-compliance based on boarding records.[3] The GMT coordinator's contact information is also published on NOAA's SEFSC's website and he can be contacted directly to do dockside inspections with no penalty attached prior to a vessel's departure.[4] Louisiana Sea Grant is a federal/state partnership administered by NOAA pairing Sea Grant resources with academic institutions and includes McNeese State University, University of Louisiana at Lafayette, Southern University, Louisiana State University, Southeastern Louisiana University, Nicholls State University, University of New Orleans, Tulane University, Xavier University, and LUMCON (Louisiana University Marine Consortium).[5] One of Louisiana Sea Grant's main focus areas is sustainable fisheries and aquaculture. In partnership with LSU Agricultural Center and LDWF, Louisiana Sea Grant developed the LFF Program, focused on education, quality, and sustainability. Currently, for the shrimp industry, LFF organizes education workshops and seminars for commercial fishermen to promote best practices in the fishing industry and update industry members on new technologies and methods that may improve their product or business. Texas Sea Grant has been active in training fishermen and captains across the Gulf of Mexico. In 2014, as part of a grant from NFWF, a marine extension agent and a marine fisheries specialist traveled to conduct dockside inspections, reaching 500 captains and crewmembers.[6] The GASFF has also been active hosting workshops for commercial fishermen for at least 30 years. Efforts focused on in TED and BRD research and development and gear outreach have been deemed successful by NOAA Fisheries and the Foundation.[7] The most recent outreach efforts by the Foundation were from 2011-2013. In that time period, the Regional Coordinators for the project traveled to 8		

States in the Gulf and South Atlantic, visiting 74 cities. Regional Coordinators disseminated TED and BRD instruction manuals in English, Spanish, and Vietnamese.		

[1] NOAA Fisheries. *Southeast Fishery Bulletin*. February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[2] "Commercial Shrimping" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/commercial-shrimp

[3] NOAA Fisheries. *Southeast Fishery Bulletin*. February 20, 2013. http://sero.nmfs.noaa.gov/fishery_bulletins/documents/pdfs/2013/fb13-011_otter_trawl_regs.pdf

[4] "Sea Turtle Staff" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/species/turtles/staff.htm

[5] *Louisiana Sea Grant*. Web. Accessed November 2015. http://www.laseagrant.org/about/academic-partners/

[6] *Texas Sea Grant*. Web. Accessed November 2015. http://texasseagrant.org/staff/tony-reisinger/

[7] Helies, F.C. Graham, G., Parker, L., Jamison J. 2013. An Expanded Outreach Program and Technology Transfer of Updated Bycatch Reduction Devices and Turtle Excluder Devices to the Southeastern U.S. Shrimp Industry. Final Report. http://www.gulfsouthfoundation.org/uploads/reports/118_final_report.pdf

Article 10 - Integration of Fisheries into Coastal Area Management

10.1 Institutional framework

10.1.1 Has an appropriate policy, legal and institutional framework been adopted in order to achieve sustainable and integrated use of living marine resources, taking into account the fragility of coastal ecosystems and the finite nature of their natural resources and the needs of coastal communities?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Several agencies in Louisiana that address natural resources and their sustainable use. Through these agencies, a framework exists to fully address environmental and coastal resource management in Louisiana. <u>Louisiana Department of Environmental Quality (LDEQ)</u> LDEQ is the primary agency responsible for setting pollution standards and monitoring water quality of the state. The LDEQ mission is "to provide service to the people of Louisiana through comprehensive environmental protection in order to promote and protect health, safety and welfare while considering sound policies regarding employment and economic development." LDEQ is divided into numerous divisions and programs that deal with air, water, and waste monitoring and permitting as well as education and outreach programs to promote responsible stewardship of environmental resources.[1]		

Louisiana Department of Natural Resources (LDNR):
LDNR is charged with regulating development and managing resources in Louisiana's coastal zone. The LDNR contains the Office of Conservation, Office of Mineral Use, and Office of Coastal Management, all of which play a role in managing oil, gas, and lignite resources of the state. The Office of Coastal Management is responsible for the regulation of uses in the Louisiana coastal zone, especially those which have a direct and significant impact on coastal waters. [2]

Louisiana Oil Spill Coordinator's Office (LOSCO)
The Louisiana Oil Spill Coordinator's Office (LOSCO), established by the legislature in 1991, is responsible for coordinating the state's oil spill response efforts, making sure that cleanups are properly completed and is the single point of contain for all programs related to oil spills in Louisiana. LOSCO responds to all reports of oil or hazardous substance release and coordinates regional and national response efforts. [3] They also are focused on prevention, educating citizens about oil spills and sponsoring research focused on improving prevention techniques. [4]

Louisiana Coastal Protection and Restoration Authority (CPRA)
Louisiana's Coastal Protection and Restoration Authority (CPRA) is mandated to "develop, implement, and enforce a comprehensive coastal protection and restoration Master Plan." [5] CPRA works with other state agencies and federal, state, and local political subdivisions to work toward a "safe and sustainable coast" that will protect "communities, the nation's critical energy infrastructure, and our bountiful natural resources for generations to come." [5] CPRA's main work is around the Coastal Master Plan, a multi-billion dollar plan that aims to conserve, protect, and rebuild the Louisiana coast.

FEDERAL PROGRAMS:
The Coastal and Estuarine Land Conservation program (CELCP) was created through an act of US Congress (Public Law 107-77) "for the purpose of protecting important coastal and estuarine areas that are threatened by conversion." Louisiana's CELCP plan's purpose is "the protection of important coastal and estuarine areas that have significant conservation, recreation, ecological, historical, or aesthetic values, or that are threatened by conversion form their natural or recreational state to other uses and will give priority to lands which can be effectively managed, protected, and that significant ecological value." [6] Thirty parishes are included in the CELCP area. [7]

In partnership with the EPA, the Gulf of Mexico Foundation, and the other Gulf States, Louisiana also participates in the Gulf Ecological Management Site (GEMS) Program. [8] This program "provides a regional framework for focusing attention on areas of special ecological significance to fish, wildlife, and other natural resources and furthers conservation efforts through inter-agency coordination and targeting of research, monitoring and action projects." There are 33 sites identified as GEMS in Louisiana. [9]

Louisiana coastal restoration efforts related to the Deepwater Horizon Oil Spill recovery include:

- NFWF (Gulf Environmental Benefit Fund) [10] - NRDA[11, 12] - RESTORE [13]		

[1] *Louisiana Department of Environmental Quality.* Web. Accessed November 2015. http://www.deq.louisiana.gov/portal/HOME.aspx

[2] *Louisiana Department of Natural Resources*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=9&pnid=0&nid=3

[3] *Louisiana Oil Spill Coordination Office*. Web. Accessed November 2015. http://www.losco.state.la.us/index.html

[4] "About" *Louisiana Oil Spill Coordination Office*. Web. Accessed November 2015. http://www.losco.state.la.us/about.html

[5] *Coastal Protection and Restoration Authority*. Web. Accessed November 2015. http://coastal.la.gov/about/

[6] "Coastal and Estuarine Land Conservation Program" *Louisiana Department of Natural Resources*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=103.

[7] LDNR. *Louisiana State CELCP Plan*. 2011. http://dnr.louisiana.gov/assets/OCM/Interagency/CELCP_State_Plan_ver15.pdf

[8] "Gulf Ecological Management Sites" *Gulf of Mexico Foundation*. Web. Accessed November 2015. http://www.gulfmex.org/conservation-restoration/gems/

[9] "Louisiana GEMS" *LDNR Office of Coastal Management*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=742

[10] "Gulf Environmental Benefit Fund in Louisiana" *National Fish and Wildlife Foundation.* Web. Accessed November 2015. http://www.nfwf.org/gulf/Pages/GEBF-Louisiana.aspx

[11] "NRDA Work Plans" *NOAA Gulf Spill Restoration*. Web. Accessed November 2015. http://www.gulfspillrestoration.noaa.gov/oil-spill/gulf-spill-data/

[12] "Oil Spill Restoration, DWH NRDA early Restoration" *Coastal Protection and Restoration Authority*. Web. Accessed November 2015 http://coastal.la.gov/oil-spill-content/oil-spill-overview/dwh-nrda-early-restoration/

[13] "Oil Spill Restoration, RESTORE Act" *Coastal Protection and Restoration Authority*. Web. Accessed November 2015 http://coastal.la.gov/oil-spill-content/oil-spill-overview/restore-act/

10.1.2 In view of the multiple uses of the coastal area, are representatives of the fisheries sector and fishing communities consulted in the decision-making processes involved in other activities related to coastal area management planning and development? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Coastal Master Plan was created with input from state legislatures, the public, and community organizations. This plan impacts coastal communities working in		

multiple sectors. CPRA is guided by the plan to protect and restore the Louisiana Coast. CPRA falls under the Administrative Procedures Act and Open Meetings Law which requires that the public has access to, and participates in, the decision-making process.[1,2] CPRA hosts public meetings regularly and at each meeting members of the public, including the fishing community, have an opportunity to comment. Additionally, Louisiana has task forces for major commercial fisheries (crab, shrimp, and oyster). Each task force meets multiple times per year, and a representatives from CPRA will present to the task forces at these meeting to update the fishing community on progress or changes to the Coastal Master Plan or other coastal restoration projects, and how it will affect the fishing community.[3,4]		

[1] Administrative Procedure Act (R.S. 49:950 et seq) http://www.doa.la.gov/osr/APA.PDF

[2] Open Meetings Law (R;S; 42:11) http://www.legis.la.gov/Legis/Law.aspx?d=727656

[3] Louisiana Shrimp Task Force. Meeting Agenda Dec 9, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/shrimp_task_force/39725-December%209th/stf_agenda_december_9.pdf

[4] Louisiana Oyster Task Force. Meeting Agenda Nov 10, 2015 http://www.wlf.louisiana.gov/sites/default/files/otf_agenda_11.10.15.pdf

10.1.3 Do institutional and legal frameworks regulating the possible uses of coastal resources and their access take into account the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development? **Yes...**[1] **Partly...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Title 56 states that the management of fisheries resources shall be managed for the optimum benefit of the people of Louisiana while maintaining healthy stock levels and protecting the economic interests of fishermen and their associated communities.[1] Louisiana has task forces for major commercial fisheries (crab, shrimp, and oyster). Each task force meets multiple times per year, and a representatives from CPRA will present to the task forces at these meeting to update the fishing community on progress or changes to the Coastal Master Plan or other coastal restoration projects, and how it will affect the fishing community.[2,3]		

[1] R.S. 56:638 http://law.justia.com/codes/louisiana/2014/code-revisedstatutes/title-56/rs-56-638.1

[2] Louisiana Shrimp Task Force. Meeting Agenda Dec 9, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/shrimp_task_force/39725-December%209th/stf_agenda_december_9.pdf

[3] Louisiana Oyster Task Force. Meeting Agenda Nov 10, 2015 http://www.wlf.louisiana.gov/sites/default/files/otf_agenda_11.10.15.pdf

10.1.4 (a)(i) Has the adoption of fisheries practices been promoted that avoids conflict among bottom resource users? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Both the GMFMC Shrimp FMP and the Louisiana FMP address user conflicts associated with the Louisiana shrimp fishery. Refer to 7.6.5 for details on identified user conflicts and actions taken to reduce conflict.		

10.1.4 (a)(ii) - bottom resource users and other users of the coastal area?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The primary conflicts between shrimpers and other resource users, besides the fisheries conflicts addressed in 7.6.5, are conflicts with environmental groups concerned with incidental take of sea turtles. Requirements for TEDs, and guidelines on proper handling, resuscitation and release of sea turtles have significantly reduced sea turtle mortality in the Gulf of Mexico shrimp fishery.[1,2,3] Additionally, the shrimp industry, federal and state agencies have also been active in other conservation efforts to aid the recovery of sea turtle populations including head-start programs to raise hatchling sea turtles in captivity for later release, nest protection programs in Florida, Texas and Mexico, and education programs to raise awareness among user groups regarding sea turtle conservation actions.[4,5]		

[1] 50 C.F.R. § 223.206 http://www.nmfs.noaa.gov/pr/pdfs/fr/ted_regulations.pdf

[2] 50 C.F.R. § 622
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&ved=0CB4QFjAAahUKEwjUxdbgr6THAhWCF5IKHUFhAxw&url=http%3A%2F%2Fsero.nmfs.noaa.gov%2Fsustainable_fisheries%2Fpolicy_branch%2Fdocuments%2Fpdfs%2Fcurrent_50cfr622_regulations.pdf&ei=IqvLVdSsOIKvyATBwo3gAQ&usg=AFQjCNHL-3DExdc70KBWrKBHYAtTnJ4w6g&bvm=bv.99804247,d.aWw

[3] Gallaway, Benny "Managing Shrimp Trawl Bycatch in the Gulf of Mexico" Powerpoint Presentation, Science and Sustainability Forum, New Orleans, October 2014.

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015.
http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p.47.
http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

10.1.4 (b) Have procedures and mechanisms been adopted which help settle these conflicts?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC, along with NOAA Fisheries, is responsible for monitoring and		

amending FMPs to best use the fishery resource in the Gulf of Mexico.[1] In doing so, they solicit participation from the entire fishing community. Their meetings are open to the public and public participation is actively encouraged. GMFMC uses a public "scoping" period and schedules public hearings to engage stakeholders with the goal of identifying issues, potential impacts, and alternative solutions to fishery management measures. Once a draft plan is prepared, it is presented to the public through hearings/meetings throughout the Gulf Coast for feedback. Comments submitted at these meetings are recorded and displayed on the GMFMC website. GMFMC also accepts comments through comment forms on their website, via email and mail. All comments are reviewed before FMP decisions are finalized. This final action also occurs publically, during GMFMC meetings.[2] GMFMC also communicates publicly via newsletters, social media posts, and cell phone applications, all in an effort to effectively disseminate conservation and management information.[3]Additionally, for every FMP, there is an AP composed of users of the fishery resource. Commercial and recreational fishermen, buyers, sellers, and consumers are all represented. The AP assists in advising GMFMC in the development of FMPs.[4] **<u>Louisiana</u>:** The Coastal Master Plan was created with input from state legislatures, the public, and community organizations. This plan impacts coastal communities working in multiple sectors. CPRA is guided by the plan to protect and restore the Louisiana Coast. CPRA falls under the Administrative Procedures Act and Open Meetings Law which requires that the public has access to, and participates in, the decision-making process.[5,6] CPRA hosts public meetings regularly and at each meeting members of the public, including the fishing community, have an opportunity to comment. Additionally, Louisiana has task forces for major commercial fisheries (crab, shrimp, and oyster). Each task force meets multiple times per year, and a representatives from CPRA will present to the task forces at these meeting to update the fishing community on progress or changes to the Coastal Master Plan or other coastal restoration projects, and how it will affect the fishing community.[7,8]		

[1] "Gulf Council FAQs" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/resources/education_faqs/education_council_faqs.php

[2] "Scoping through Implementation" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/fishery_management_plans/scoping-thru-implementation.php

[3] *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://gulfcouncil.org/

[4] "Committees & Panels" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/panels_committees/index.php

[5] Administrative Procedure Act (R.S. 49:950 et seq) http://www.doa.la.gov/osr/APA.PDF

[6] Open Meetings Law (R;S; 42:11) http://www.legis.la.gov/Legis/Law.aspx?d=727656

[7] Louisiana Shrimp Task Force. Meeting Agenda Dec 9, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/shrimp_task_force/39725-December%209th/stf_agenda_december_9.pdf

[8] Louisiana Oyster Task Force. Meeting Agenda Nov 10, 2015 http://www.wlf.louisiana.gov/sites/default/files/otf_agenda_11.10.15.pdf

10.2 Policy measures

10.2.1 Is public awareness being created on the need for the protection and management of coastal resources and the participation in the management process by those affected?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Multiple agencies and groups conduct outreach and public awareness around the need for coastal protection and sustainable resource management. Louisiana Sea Grant, housed under the LSU AgCenter conducts outreach to fishing and other coastal communities and interested parties about effective and sustainable coastal use. Sea Grant personnel from Extension, Communications, Education, and Law & Policy divisions regularly engage stakeholders and the public to connect communities to current issues and research on Louisiana resources.[1] LDNR, LDEQ, and CPRA all hold public hearings, scoping meetings, and comment periods for proposed actions and encourages public participation. Hearings and meetings can be located on the calendar of each prospective agency's website.[2,3,4] Louisiana is governed under the Open Meeting Act, which requires that the deliberative process of the government be open to the public, with notice provided of when and where the meeting will be held, and which includes an opportunity for the people to offer comment on the proposed ruling.[5] There are also numerous NGOs in Louisiana and across the Gulf of Mexico addressing coastal resource awareness, restoration and protection. Restore the Mississippi River Delta is a coalition of five non-profits (Environmental Defense Fund, National Audubon Society, National Wildlife Federation, Coalition to Restore Coastal Louisiana, and Lake Pontchartrain Basin Foundation) in the Gulf region dedicated to "reconnecting the Mississippi River to its delta to protect people, wildlife, and jobs." [6]		

[1] "Outreach" *Louisiana Sea Grant.* Web. Accessed November 2015. http://www.laseagrant.org/outreach/

[2] "Calendar" *Louisiana Department of Natural Resources*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=calendar

[3] "Calendar" *Louisiana Department of Environmental Quality.* Web. Accessed November 2015. http://www.deq.louisiana.gov/portal/Default.aspx?tabid=2605 http://coastal.la.gov/calendar/

[4] "Calendar" *Coastal Protection and Restoration Authority*. Web. Accessed November 2015. http://coastal.la.gov/calendar/

[5] Open Meetings Law (R;S; 42:11) http://www.legis.la.gov/Legis/Law.aspx?d=727656

[6] *Restore the Mississippi River Delta*. Web. Accessed November 2015,. http://www.mississippiriverdelta.org/about/who-we-are/

10.2.2 Has an attempt been made to assess the economic, social and cultural value of coastal resources in order to assist decision-making on their allocation and use?

(i) - economic **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
GSMFC, a research and information-sharing network consisting of the five Gulf states, has conducted socioeconomic research on the baseline of seafood dealers and processors in each of the Gulf States, including overall workforce satisfaction.[1,2] The GSMFC Economics program also produced economics surveys of the inshore shrimp fisheries.[3,4] NOAA conducts research on the demographics and economies of coastal communities, including housing an index of the total economy of coastal areas.[5,6] The National Ocean Economics Program (NOEP), sponsored by NOAA, provides current policy-relevant economic and demographic information on changes and trends along the U.S. coast and coastal waters.[7] Gulffishinfo.gov (FINFO), a program of GSMFC, also collects and makes public information about the economic status of Gulf of Mexico fisheries.[8] Louisiana Sea Grant has the capacity to do research on the economics of the seafood industry and coastal communities, and one of the strategic initiatives of Louisiana Sea Grant is Resilient Communities and Economies. In 2011, Louisiana Sea Grant conducted research focused on increasing the resiliency of coastal communities facing natural hazards, including climate change and sea level rise. [10]		

[1] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[2] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[3] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[4] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[5] "Social Science Research Group" NOAA Southeast Fisheries Sciences Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[6] *NOAA's State of the Coast*. Web. Accessed November 2015. http://stateofthecoast.noaa.gov/economy.html

[7] *National Ocean Economics Program*. Web. Accessed November 2015. http://www.oceaneconomics.org/About/overview.aspx

[8] *Gulf FINFO*. Web. Accessed November 2015. http://gulffishinfo.org/Gulf-Fisheries-Economics

[9] "Strategic Initiatives" *Louisiana Sea Grant.* Web. Accessed November 2015. http://www.laseagrant.org/about/strategic-initiatives/initiatives/#communities

[10] Davis, M. Wilkins, J. 2011. A defining resource: Louisiana's place in the emerging water economy. "Loyola Law Review," 57: 273-198, 2011 http://appl103.lsu.edu/seagrant/collaresh.nsf/DisplayProjectDetail?OpenAgent&A/SCE-01-2011

10.2.2 (ii) - social and cultural **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
LDWF mission statement is "to manage, conserve, and promote wise utilization of Louisiana's renewable fish and wildlife resources and their supporting habitats through replenishment, protection, enhancement, research, development, and education for the social and economic benefit of current and future generations; to provide opportunities for knowledge of and use and enjoyment of these resources; and to promote a safe and healthy environment for the users of the resources."[1] Regulatory actions by LDWF are required to include assessment of social and economic impacts.[2] GSMFC has conducted socioeconomic research on the baseline of seafood dealers and processors in each of the Gulf states, including overall workforce satisfaction and the value of being involved in the seafood sector.[3,4] The GSMFC Economic Data Program also published and economic survey of the inshore Gulf of Mexico shrimp fleet.[5] NOAA conducted research in 2005 to identify communities associated with the fishing industry in coastal Louisiana to assist in management of resources by identifying areas of economic and social dependence on the resource. This report provides profiles (in three volumes) of communities along the Louisiana coast including a brief cultural geographic description, earnings by industry, population demographics, and fishing infrastructure and activities for each community.[7, 8, 9] The NOAA Southeast Fisheries Science Center contains a socioeconomic research group that conducts applied research on socioeconomic and cultural aspects of marine resources in the Gulf of Mexico and recently developed 'community		

snapshots' on the SERO website providing socioeconomic information on coastal communities.[9]		

[1] *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/about-ldwf

[2] La. R.S. 49:950 et seq. http://www.doa.la.gov/osr/APA

[3] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[4] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[5] Miller, Alexander, and Jack Isaacs. 2014. An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[6] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume I: Ascension Parish through Lafayette Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/ascension_lafayette.pdf

[7] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume II: Lafourche Parish through St. Landry Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/lafourche_stlandry.pdf

[8] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume III: St. Martin Parish through Vermillion Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/stmartin_vermilion.pdf

[9] "Social Science Research Group" NOAA Southeast Fisheries Sciences Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[10] "Snapshots of Human Communities and Fisheries in the Gulf of Mexico and South Atlantic" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/

10.2.3 Have risks and uncertainties involved in the management of coastal areas been taken into account in setting policies for the management of coastal areas? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
CPRA commissioned RAND Corporation to develop a Coastal Louisiana Risk Assessment (CLARA) model "to assess the degree to which various projects help coastal communities avoid or reduce damage from hurricanes. CLARA made it possible to consistently and systematically evaluate potential projects for inclusion		

in the Master Plan on the basis of how well they reduce damage in Louisiana's coastal region."[1] The model attempts to present a thorough analysis of risk by addressing both system fragility and uncertain future scenarios.		

[1] Fischback, J.R., Johnson, D.R., Ortiz, D.S., Bryant, B.P., Hoover, M., Ostwald, J. 2012. Coastal Louisiana Risk Assessment Model: Technical Description and 2012 Coastal Master Plan Analysis Results. Rand Corporation Technical Report.

10.2.4 In accordance with capacities, have measures been taken to establish or promote the establishment of systems to monitor the coastal environment as part of the coastal management process using physical, chemical, biological, economic and social parameters?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
There is a network of agencies and programs responsible for monitoring the coastal environment of Louisiana and the Gulf of Mexico taking into account physical, chemical, biological, economic, and social parameters. LDEQ, LDNR, CPRA, and LDWF are the main state agencies that collaborate on coastal management activities.[1,2,3,4] For details on each agencies role in coastal management, refer to the response to 10.1.1. As government entities, the above agencies are governed under the Open Meeting Act, which requires that the deliberative process of the government be open to the public, with notice provided of when and where the meeting will be held, and which includes an opportunity for the people to offer comment on the proposed ruling.[5] Additionally, Louisiana Sea Grant, while not a government agency, conducts fisheries research, as well as the socio-economic research on coastal communities and impacts of coastal management on these communities. In 2011, Louisiana Sea Grant conducted research focused on increasing the resiliency of coastal communities facing natural hazards, including climate change and sea level rise.[6] Louisiana Sea Grant works in collaboration with management agencies and coastal communities. Gulf-wide and national monitoring programs also provide valuable data for fisheries and coastal management in Louisiana including: - National Atmospheric Deposition Program http://nadp.sws.uiuc.edu/ - Gulf of Mexico Coastal Ocean Observing System (GCOOS) http://gcoos.org/ - National Data Buoy Center http://www.ndbc.noaa.gov/index.shtml - National Weather Service http://www.srh.noaa.gov/mob/ - NOAA Tide reports http://tidesonline.nos.noaa.gov/ - USGS Water Data http://waterdata.usgs.gov/nwis/ NOAA SEFSC conducts an Annual Economic Survey of Federal Gulf Shrimp		

Permit Holders each spring collecting data on operating expenses and costs associated with owning and maintaining shrimp vessels.[7] Each year a third of the permit holders are randomly selected for this survey and information is used to assess trends in the financial state of the fishery, social and economic effects of regulations, and other economic factors impacting the Gulf shrimp fishery. GSMFC Fisheries Economic Data Program has conducted economic analyses for the inshore (non-federally-permitted) shrimp fleet in 2008 and 2012.[8,9,10] GSMFC has also conducted socioeconomic research on the baseline of seafood dealers and processors in Louisiana and other Gulf states, including overall workforce satisfaction and the value of being involved in the seafood sector.[11,12] The GMFMC Shrimp FMP contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a RIR.[13] NOAA Fisheries SERO also conducts socioeconomic research on coastal communities in Louisiana. In 2005, NOAA produced a report identifying fishing communities in coastal Louisiana in three volumes, and currently SERO maintains 'community snapshots' on their website including demographic and economic information on coastal communities.[114,15,16,17,18] Economic and social monitoring are also an integral part of coastal monitoring and NOAA Center for Sponsored Coastal Ocean Research conducts research on economic and social impacts of both natural and anthropogenic events and influences on coastal communities.[19]		

[1] *Louisiana Department of Environmental Quality.* Web. Accessed November 2015. http://www.deq.louisiana.gov/portal/HOME.aspx

[2] *Louisiana Department of Natural Resources*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=9&pnid=0&nid=3

[3] *Coastal Protection and Restoration Authority*. Web. Accessed November 2015. http://coastal.la.gov/about/

[4] Bourgeois, M., Landry, L., Lightner, J., Marx, J. Semon, K. 2015. Louisiana Shrimp Fishery Management Plan. LDWF Office of Fisheries. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf/

[5] Open Meetings Law (R;S; 42:11) http://www.legis.la.gov/Legis/Law.aspx?d=727656

[6] Davis, M. Wilkins, J. 2011. A defining resource: Louisiana's place in the emerging water economy. "Loyola Law Review," 57: 273-198, 2011 http://appl103.lsu.edu/seagrant/collaresh.nsf/DisplayProjectDetail?OpenAgent&A/SCE-01-2011.

[7] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[8] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[9] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[10] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[11] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[12] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[13] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[14] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume I: Ascension Parish through Lafayette Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/ascension_lafayette.pdf

[15] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume II: Lafourche Parish through St. Landry Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/lafourche_stlandry.pdf

[16] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume III: St. Martin Parish through Vermillion Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/stmartin_vermilion.pdf

[17] "Social Science Research Group" NOAA Southeast Fisheries Sciences Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[18] "Snapshots of Human Communities and Fisheries in the Gulf of Mexico and South Atlantic" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/

[19] *NOAA Center for Sponsored Coastal Ocean Research*. Web. Accessed November 2015. http://coastalscience.noaa.gov/about/centers/cscor

10.2.5 Has multi-disciplinary research in support of coastal area management been promoted on

(i) - environmental and biological aspects? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
In addition to monitoring, the above programs listed in 10.2.4 contain research		

activities to support coastal area management. In 2011, the Water Institute was established as a "not-for-profit, independent applied research institute dedicated to providing advanced understanding and technical expertise to support management of coastal, deltaic and water systems, within Louisiana, the Gulf Coast and around the world. Our mission supports the practical application of innovative science and engineering, providing solutions that benefit society."[1] The Water Institute was established in part by CPRA and much of the research done at the Water Institute is taken into consideration for CPRA's decisions regarding the Coastal Master Plan. Some of the current projects focus on the biological and environmental aspects of the coast.[2] The GEMS Program is a partnership between federal and state agencies to further coastal conservation through targeted research and monitoring, and development of action plans.[3] This program "provides a regional framework for focusing attention on areas of special ecological significance to fish, wildlife, and other natural resources and furthers conservation efforts through inter-agency coordination and targeting of research, monitoring and action projects." There are 33 sites identified as GEMS in Louisiana.[4]		

[1] *The Water Institute*. Web. Accessed November 2015.http://thewaterinstitute.org/about/

[2] "Our Projects" *The Water Institute*. Web. Accessed November 2015. http://thewaterinstitute.org/what-we-do/our-projects/

[3] "Gulf Ecological Management Site Program" *Environmental Protection Agency*. Web. Accessed November 2015. http://www.epa.gov/gmpo/gem2.html

[4] "Office of Coastal Management, Louisiana GEMS" *Louisiana Department of Natural Resources*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=742

10.2.5 (ii) - economic and social aspects? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Louisiana Sea Grant has the capacity to do research on the economics of the seafood industry and coastal communities, and one of the strategic initiatives of Louisiana Sea Grant is Resilient Communities and Economies. In 2011, Louisiana Sea Grant conducted research focused on increasing the resiliency of coastal communities facing natural hazards, including climate change and sea level rise.[1] The Water Institute also has projects focused on social aspects of coastal management.[2] NOAA Center for Sponsored Coastal Ocean Research conducts research on economic and social impacts of both natural and anthropogenic events and influences on coastal communities.[3] NOAA SEFSC conducts an Annual Economic Survey of Federal Gulf Shrimp		

Permit Holders each spring collecting data on operating expenses and costs associated with owning and maintaining shrimp vessels.[4] Each year a third of the permit holders are randomly selected for this survey and information is used to assess trends in the financial state of the fishery, social and economic effects of regulations, and other economic factors impacting the Gulf shrimp fishery. GSMFC Fisheries Economic Data Program has conducted economic analyses for the inshore (non-federally-permitted) shrimp fleet in 2008 and 2012.[5,6,7] GSMFC has also conducted socioeconomic research on the baseline of seafood dealers and processors in Louisiana and other Gulf states, including overall workforce satisfaction and the value of being involved in the seafood sector.[8,9] The GMFMC Shrimp FMP contains a socioeconomic characterization of the shrimp fishery and each amendment to the FMP includes information on social and economic impacts and requires a RIR.[10] NOAA Fisheries SERO also conducts socioeconomic research on coastal communities in Louisiana.[11] In 2005, NOAA produced a report identifying fishing communities in coastal Louisiana, and currently SERO maintains 'community snapshots' on their website including demographic and economic information on coastal communities.[12,13,14,15] LDWF, LDNR and LDEQ are required, through the regulatory process and under the Louisiana Open Meetings Law to include public participation in the rulemaking process and that the deliberative process be open to the public, with notice provided of when and where the meeting will be held, and which includes an opportunity for the people to offer comment on the proposed ruling.[16,17]		

[1] Davis, M. Wilkins, J. 2011. A defining resource: Louisiana's place in the emerging water economy. "Loyola Law Review," 57: 273-198, 2011 http://appl103.lsu.edu/seagrant/collaresh.nsf/DisplayProjectDetail?OpenAgent&A/SCE-01-2011.

[2] "Our Projects" *The Water Institute*. Web. Accessed November 2015. http://thewaterinstitute.org/what-we-do/our-projects/

[3] *NOAA Center for Sponsored Coastal Ocean Research*. Web. Accessed November 2015. http://coastalscience.noaa.gov/about/centers/cscor

[4] "Economic Data Collection for the Gulf of Mexico and South Atlantic Shrimp Fishery" *NOAA Southeast Fishery Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/shrimp.htm

[5] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[6] Miller, Alexander L., and Jack C. Isaacs. 2011. *An Economic Survey of the Gulf of Mexico Inshore Shrimp Fishery: Implementation and Descriptive Results for 2008*. Gulf States Marine Fisheries Commission Publication Number 195 http://www.gsmfc.org/publications/GSMFC%20Number%20195.pdf

[7] Miller, Alexander, and Jack Isaacs. 2014. *An Economic Survey of the U.S. Gulf of Mexico Inshore Shrimp Fishery: Descriptive Results for 2012*. Gulf States Marine Fisheries Commission Publication, Publication Number 227. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20227.pdf

[8] Miller, Alexander, Ebenezer Ogunyinka, and Jack Isaacs. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Dockside Seafood Dealers. Gulf States Marine Fisheries Commission Publication, Publication Number 226. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20226.pdf

[9] Miller, Alexander, Jack Isaacs, and Latika Bharadwaj. 2014. An Economic Baseline and Characterization of U.S. Gulf of Mexico Seafood Processors. Gulf States Marine Fisheries Commission Publication, Publication Number 225. Ocean Springs, Mississippi. http://www.gsmfc.org/publications/GSMFC%20Number%20225.pdf

[10] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[11] "Social Science Research Group" NOAA Southeast Fisheries Sciences Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/socialscience/

[12] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume I: Ascension Parish through Lafayette Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/ascension_lafayette.pdf

[13] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume II: Lafourche Parish through St. Landry Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/lafourche_stlandry.pdf

[14] Assessment, Impact. Inc., 2005. Identifying communities associated with the fishing industry in Louisiana, Volume III: St. Martin Parish through Vermillion Parish Communities. Final report. NOAA Fisheries, South East Region. US Department of Commerce. WC133F-02-SE-0297. St. Petersburg, Florida. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/documents/pdfs/communities/2013/stmartin_vermilion.pdf

[15] "Snapshots of Human Communities and Fisheries in the Gulf of Mexico and South Atlantic" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/

[16] Administrative Procedure Act (R.S. 49:950 et seq) http://www.doa.la.gov/osr/APA.PDF

[17] Open Meetings Law (R:S; 42:11) http://www.legis.la.gov/Legis/Law.aspx?d=727656

10.2.5 (iii) - legal and institutional aspects? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
LDWF is governed under the LA Revised Statutes, Title 56, and LDNR is governed under Louisiana Administrative Code, Title 43 with Coastal Management falling under Chapter 7. [1,2,3]		

[1] La. R.S. 56 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/34690-title-56/2010title56complete.pdf

[2] La Admin. Code Title 43, http://www.doa.la.gov/Pages/osr/lac/LAC-43.aspx

[3] La Admin. Code Title 43, Chapter 7 http://www.doa.la.gov/Pages/osr/lac/LAC-43.aspx

10.3 Regional cooperation

10.3.1 Do States with neighboring coastal areas cooperate with one another in:

(i) - the sustainable use of resources? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Fisheries Resources in the Gulf of Mexico are managed regionally by GMFMC and/or coordinated through GSMFC.[1,2] The GMFMC is one of the regional Fishery Management Councils established by the Fishery Conservation and Management Act of 1976. The GMFMC consists of 17 voting members, including the Southeast Regional Administrator of NOAA Fisheries, the directors of the five Gulf state marine resource management agencies and eleven additional members who are nominated by the state governors and appointed by the Secretary of Commerce. In addition, there are four nonvoting members representing the USCG, USFWS, Department of State, and GSMFC. GMFMC meets five times a year at various locations around the Gulf coast. GMFMC is charged with development of FMPs for all species managed in federal waters and collaborates on management with the five Gulf states. Proposed rule changes are then submitted to NOAA Fisheries for further review and approval before implementation. GMFMC has developed a Shrimp FMP, which was implemented in 1981 and has been updated several times. Once of the stated objectives of the FMP is to "coordinate the development of shrimp management measures by the GMFMC with shrimp management programs of the several states, where feasible".[3] The Gulf States Marine Fisheries Compact promotes the efficient utilization of fisheries and sound conservation practices through collaboration and data-sharing between states for effective management.[4] Recommendations for potential management actions to ensure the sustainability of resources are included in the regional management plans, though no state is required to implement the recommendations.[5] The US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Gulf of Mexico Initiative (GoMI) was created to assist producers in the five Gulf states by improving water quality and ensuring sustainable production.[6] GoMI provides financial assistance and resources to help producers apply sustainable practices and wildlife habitat management. GoMI also works to reduce and control agricultural run-off and decrease use of over-utilized water resources. A series of NRCS programs are available to GoMI including the Environmental Quality Incentives Program, Wildlife Habitat Incentive Program, Wetlands Reserve Program, and Conservation Stewardship Program. There is cooperation between the United States and Mexico regarding fisheries management in the Gulf of Mexico. The United States-Mexico Fisheries Cooperation Program is a bilateral consultative agreement that was informally		

agreed upon by National Marine Fisheries Service and SAGARPA in 1983.[7] Three MOU have been formalized through this relationship including the MEXUS-Golfo research program. FCTs between NMFS and CONAPESCA occur annually and MEXUS-Golfo working groups are held as needed. Recent FCT meetings have included discussion of sustainable fisheries management, protection and conservation of species such as sea turtles, enforcement cooperation, aquaculture, collaborative research, and participation in fisheries related international organizations.		

[1] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[2] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/

[3] GMFMC. *The Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, United States Waters*. Gulf of Mexico Fishery Management Council, Tampa, Florida. 1981. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-01&02%20Final%201981-11.pdf

[4] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[5] Guillory, V. Perry, H. VanderKooy, S. 2001. The Blue Crab Fishery of the Gulf of Mexico, United States: A Regional Management Plan. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20096.pdf

[6] "Gulf of Mexico Initiative (GoMI)" *United States Department of Agriculture (UDSA) Natural Resources Conservation Service*. Web. Accessed November 2015. http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull//?cid=stelprdb1046039

[7] NOAA. 2014. *International Agreements Concerning Living Marine Resources of Interest to NOAA Fisheries*. http://www.nmfs.noaa.gov/ia/intlagree/docs/2012/international_agreements.pdf

10.3.1 (ii) - the conservation of the environment? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The Gulf of Mexico Alliance is a state, federal, and private partnership designed to enhance regional cooperation in the Gulf of Mexico in order to advance the environmental and economic health of the Gulf.[1] The Alliance serves as a forum for shared knowledge and reduces duplication of effort by encouraging collaboration. The Alliance's main focuses until 2014 include water quality, nutrient reduction, ecosystem assessment, coastal community resilience and habitat conservation and restoration. In 2014 the Alliance restructured, and moving forward will be focused on water resources, habitat, community resilience, data and monitoring, wildlife and fisheries, and education and engagement. The EPA Gulf of Mexico Program also works regionally in the Gulf with all five states to enhance community resilience, protect coastal habitat and ecosystems, and improve water quality.[2] The National Estuarine Research Reserve (NERR) system provides an opportunity for collaboration and shared research knowledge between NERR sites across the Gulf of Mexico. There are also numerous NGOs working to address regional conservation concerns within the Gulf of Mexico.[3]		

International cooperation occurs between the United States and Mexico on environmental conservation. The North American Agreement on Environmental Cooperation (NAAEC) is a side agreement between the United States, Canada and Mexico, developed around the North American Free Trade Agreement (NAFTA), recognizing the need for environmental coordination and cooperation. This agreement establishes general obligations to which each country is committed and each member establishes its own policies and levels of environmental protection based on these commitments. The Commission for Environmental Cooperation and the North American Fund for Environmental Cooperation (NAFEC) were established through the NAAEC.[4] The Unites States and Mexico also work in cooperation with the International Maritime Organization (IMO) on addressing marine pollution issues from vessel discharge and ocean dumping.[5]		

[1] *Gulf of Mexico Alliance*. Web. Accessed November 2015. http://www.gulfofmexicoalliance.org/

[2] "Gulf of Mexico Program" *Environmental Protection Agency*. Web. Accessed November 2015. http://www.epa.gov/gmpo/

[3] "National Estuarine Research Reserve System" *NOAA Office of Coastal Management*. Web. Accessed November 2015. http://www.nerrs.noaa.gov

[4] *Commission for Environmental Cooperation*. Web. Accessed November 2015. http://www.cec.org/Page.asp?PageID=1226&SiteNodeID=310&BL_ExpandID=878

[5] *International Maritime Organization.* Web. Accessed November 2015. http://www.imo.org/About/Pages/Default.aspx

Article 11 - Post-Harvest Practices and Trade

11.1 Responsible fish utilization

11.1.11 Is international domestic trade in fish and fishery products in accord with sound conservation and management practices through the identification of the origin of fish and fish products traded?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The United States is a member of the World Trade Organization (WTO), and thus prescribes to the rules and regulations of members bodies as relates to import and export of goods.[1] According to the 2012 report by the FAO on the State of Fisheries and Aquaculture, the United States had surpassed Japan as the largest importer of shrimp in the world.[2] Within their Technical Barriers to Trade (TBT) regulations, the WTO requires that trade access is granted equally, under uniformly favorable conditions and that a product may not be discriminated against in the marketplace due to origin.[3] Within the United States, under the Code of Federal Regulations 101.18,		

identification of fishery products from domestic and international trade are required by the Customs and Border Protection Authority to have labels identifying their origin;[4] under the USDA Country of Origin Labels (COOL) Act, fish and shellfish shall be labeled to indicate whether they are from a farmed or wild-caught product.[5] At any time, the USDA may audit origin claims to verify an origin claim or product label.[6] The USDA Agricultural Marketing Service (AMS) is charged with administering and enforcing COOL requirements.[7,8] Under Section 403(a)(1) of 21 CFR 101,18, The Food and Drug Administration (FDA) prohibits any imported or domestic products from mislabeling or misleading consumers as to a product's origin.[9] The Federal Food, Drug and Cosmetics Act requires that all products entering into the United States have a label, in English, that contains information on nutrition, serving size, country of origin, and manufacturer's name and address.[10]

The imports of seafood and shrimp from abroad are managed under the Imported Seafood Safety Program and HACCP regulations administered by the U.S. Food and Drug Administration (FDA), which is charged with protecting human health through monitoring of food safety.[11] Under the regulations of the FDA, in the course of HACCP testing, imported shrimp in which "adulterants" (antibiotics) are found are refused entry into the United States.[12] In 2008, according to the FDA, 6.9% of imported shrimp contained illegal amounts of antimicrobial residue and were refused entry in to U.S. ports.[13] There is currently a "Detention without Physical Examination" refusal in effect for several major companies that import shrimp into the United States.[14]

NOAA/NMFS tracks imports and exports through the United States by type and country of origin, and makes their findings available on their website.[15]

Louisiana also maintains laws regarding seafood packaging and labeling and has established a certification program for wild caught Louisiana seafood.[16]

Louisiana Revised Statutes 578.10 grant the Secretary of LDWF the authority to adopt regulations establishing standards for the packaging of seafood in Louisiana, and grants the Louisiana Seafood Promotion and Marketing Board (LSPMB) authority to make recommendations to the Secretary for such purpose.[17]

Louisiana Administrative Code Title 76 Part VII, Section 373 defines regulations for shrimp packaging. Any package bearing the words "Gulf of Mexico" or "Gulf USA Shrimp" must be harvested or landed in the Gulf of Mexico or one of the adjoining states of Texas, Louisiana, Mississippi, Alabama or Florida; any package labeled "Louisiana" or "Louisiana shrimp" must be taken, harvested, or landed in Louisiana.[18]

LDWF established the Louisiana Wild Seafood Certification Program (LWSCP) to build a brand that guarantees the origin of wild-caught Louisiana seafood products. Products with the Louisiana Certified logo have met strict guidelines and regulations set by the Louisiana Administrative Code, Title 76 Part I, Chapter 7.[19] The program requires participating seafood dealers and processors to be trained on

program guidelines, state and federal regulations, and best practices for quality and safety of seafood products, and requires product traceability to verify that it is of Louisiana origin.[20]		

[1] World Trade Organziation. (2015). *Members and Observers of the WTO*. Retrieved from World Trade Organization: https://www.wto.org/english/thewto_e/countries_e/org6_map_e.htm

[2] Food and Agriculture Organization of the United Nations. (2012). *State of the World Fisheries and Aquaculture.* Rome: FAO.

[3] World Trade Organization. (1994, April 15). *Agreement on Technical Barriers to Trade.* Retrieved from Legal Texts: the WTO Agreements: https://www.wto.org/english/docs_e/legal_e/ursum_e.htm

[4] 21 C.F.R. § 101.18

[5] 2 C.F.R. § 60.200

[6] 2 C.F.R. § 60.300 (2)

[7] *U.S. Department of Agriculture, Agricultural Marketing Service*. Web. Accessed November 2015. http://www.ams.usda.gov/AMSv1.0/cool

[8] "COOL Compliance and Enforcement Requirements" *U.S. Department of Agriculture.* Web. Accessed November 2015. http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5095400

[9] 21 C.F.R. § 101.18

[10] Nam, V. T. (2005). *U.S. Technical Barriers to Trade and Vietnamese Seafood Exports.* Tokyo: National Economics University. Retrieved from http://www.grips.ac.jp/vietnam/VDFTokyo/Temp/Doc/2005/DP07E-TVNamJul05.pdf

[11] U.S. Department of Health and Human Services. (2015, March 24). *The Imported Seafood Safety Program*. Retrieved from The Food and Drug Administration: http://www.fda.gov/Food/GuidanceRegulation/ImportsExports/Importing/ucm248706.htm#HACCP

[12] Lee, J. O., & Phelps, N. (2014). *Antimicrobial Residue in Farmed Shrimp.* Minneapolis : University of Minnesota College of Veterinary Medicine.

[13] *U.S. Department of Health and Human Services*. Web. Accessed March 2015.. http://www.fda.gov/Food/GuidanceRegulation/ImportsExports/Importing/ucm248706.htm#HACCP

[14] Lee, J. O., & Phelps, N. (2014).

[15] National Marine Fisheries Service. (2015, May). *National Oceanic and Atmospheric Administration*. Retrieved from Commercial Fishery Statistics: http://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/applications/trade-by-product

[16] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 61. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[17] La. R.S. 56:578.10 https://www.legis.la.gov/legis/Law.aspx?d=105405

[18] LAC 76:VII.373 http://www.doa.la.gov/Pages/osr/lac/books.aspx

[19] LAC 76:I.701-707 http://www.doa.la.gov/Pages/osr/lac/books.aspx

[20] Bourgeois et al.,2015. p. 61.

11.2 Responsible international trade

11.2.3 Are measures affecting international trade in fish and fishery products transparent, based, when applicable, on scientific evidence, and in accordance with internationally agreed rules?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The United States International Trade Commission regulates trade of seafood products in accord with WTO agreements.[1,2] The WTO, created in 1995, is an international organization that deals with rules of trade between nations through agreements that are negotiated and signed by participating countries with the aim of helping producers, exporters and importers conduct business internationally.[3] WTO agreements relating to fish products include the Agreement of Sanitary and Phytosanitary Measures (SPS), the Agreement on TBT Agreement, the Agreement on Subsidies and Countervailing Measures. The WTO SPS Measures are designed to protect human, animal and plant life or health and the Agreement on TBT requires member countries to utilize internationally agreed standards as the basis for technical trade regulations and limits on imports from other countries. The SPS Agreement recognizes the right of each country to protect its population, but requires that any measures taken to restrict trade be based on scientific evidence or risk assessment and the TBT Agreement set rules on how to handle aspects such as labeling disputes or testing procedures. U.S. practices are in accordance with the WTO agreements on SPS and TBT. In 1995, the USFDA implemented the HACCP system for fish and fishery products stipulating that seafood importers must meet the same HACCP requirements as U.S. processors. The U.S. Food and Drug Administration (USFDA) detains and inspects samples of imported seafood at ports of entry into the U.S. under the Federal Food, Drug, and Cosmetic Act (FFDCA) and reports on all detentions and violations.[4] USFDA foreign inspection coverage is based on product priorities and country-specific factors such as a history of high volume seafood exported to the US, or past violations and outcomes.[5] Under the Food Safety Modernization Act (FSMA), which went into effect in 2011, The USFDA is required to report annually on the scope of their responsibility and activities under its jurisdiction. *The Annual Report on Food Facilities, Food Imports, and FDA Foreign Offices* contains information on USFDA actions including cooperation with other state, federal and local agencies, number of inspections of both domestic and foreign facilities, and number of samples analyzed for USFDA compliance.[6] The USFDA website contains features providing access and transparency of agency		

activities.

The U.S. is a participating member of the Agreement on Subsidies and Countervailing Measures and has entered into, or is currently negotiating, several free trade agreements to minimize trade restrictions and obstacles.[7] Through these agreements, the US has reduced or eliminated most trade restrictions and has some of the lowest tariffs among participating nations.[8]

Thailand, Indonesia, Ecuador, India, Vietnam, Mexico, and Malaysia are some of the largest exporters of shrimp into America, all of whom are also members of the WTO.[9,10] Imports of shrimp have recently (May, 2015) been refused from Malaysia for human health concerns, including unsafe levels of bacteria and nitrofurans, an antibiotic used to treat farmed shrimp that has carcinogenic effects in humans.[11] Additionally, several firms from Indonesia and Malaysia have been placed on a "Detention without Physical Examination" list due to consistently unsafe levels of antibiotics.[12]

The United Stated implemented Public Law 101-162, Section 609 in 1989, which prohibits the import of shrimp products that were harvested with commercial fishing technology that may adversely affect sea turtles.[13,14] Nations that have adopted sea turtle protection programs comparable to the U.S. or where incidental capture does not present a threat to sea turtles are exempt from this ban. Nations that seek to import shrimp into the U.S. must be certified annually, and the U.S. may inspect, if requested, portions of a nation's shrimp trawl fleet to verify that proper sea turtle conservation measures (use of TEDs) are in place. NOAA Fisheries Harvesting Systems Unit also provides extensive training throughout the world to improve TED use in trawl fisheries. There are approximately 40 countries certified to export shrimp to the U.S. and a listing of certified nations is published annually in the Federal Register.[15] When this law was first implemented, several disputes were filed; however, ultimately the WTO found that the U.S. compliance measures are justified as a conservation measure under Article XX(g) of the GATT 1994.[16]

Concerns regarding Illegal, Unreported and Unregulated (IUU) fishing has recently become the focus of a new Presidential Initiative designed to combat IUU fishing, including identifying actions for how to limit seafood fraud and work with international partners to track seafood from harvest points to entry into the United States.[17] Eliminating IUU fishing would also extend to the Trans-Pacific Partnership, which is a regional trade agreement currently being brokered between the United States and many nations who export large amounts of seafood into the U.S, though reservations have been expressed regarding the impact the TPP would have on the U.S.'s ability to refuse unsafe seafood from potential TPP partners.[18,19]

In 2013, the Coalition of Gulf Shrimp Industries filed a petition to launch a Countervailing Duty Investigation into the effects of importation of shrimp and potential market distortion of domestic product because of subsidies offered to exporters, claiming that unfair trading was damaging American shrimp industry.[20] After several years, it was determined that unfair trading was not the cause of impacts

to the domestic shrimp industry, but it was instead the effects of the 2010 BP oil spill; no countervailing duties were lifted.[21] Sponsored by Louisiana Congressman Bill Boustany, H.R. 1907, the Trade Enforcement and Trade Facilitation Act (PROTECT Act) introduced in 2015, proposes stricter oversight and potential power of trade refusals relating to IUU imports affecting the health of the domestic shrimp market; it is touted as a solution to the impacts imported shrimp have on prices of domestic shrimp.[22] The bill has not yet passed and it is unclear what effect it would have on international trade in shrimp products.		

[1] *The United States International Trade Commission*. Web. Accessed November 2015. http://www.usitc.gov/tata/hts/bychapter/

[2] "Fish Trade Regulations" *FAO*. Web. Accessed November 2015. http://www.globefish.org/fish-trade-regulations-on-the-web.html

[3] The World Trade Organization (WTO). Web. Accessed September 2015. http://wto.org/english/thewto_e/thewto_e.htm

[4] Allshouse, J., J. Buzby, D. Harvey, and D. Zorn. Chapter 7. International Trade and Food Safety, Chapter 7-International Trade and Seafood Safety. Economic Research Service/USDA.

[5] FDA. 2012. Report to Congress: Annual Report on Food Facilities, Food Imports, and FDA Foreign Offices, Provisions of the FDA Food Safety and Modernization Act http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Seafood/ucm150954.htm

[6] *Food and Drug Administration.* Web. Accessed November 2015. http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm315486.htm

[7] Renée Johnson. *Sanitary and Phytosanitary (SPS) and Related Non-Tariff Barriers to Agricultural Trade. Specialist in Agricultural Policy*. Congressional Research Service Report 7-5700. R43450. March 31, 2014 http://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43450.pdf

[8] Roheim, C.A. 2004. "Impacts on Sustainability." *Global agricultural trade and developing countries* (2004): 275. http://siteresources.worldbank.org/INTPROSPECTS/Resources/GATChapter15.pdf

[9] National Marine Fisheries Service. (2015, May). *National Oceanic and Atmospheric Administration*. Retrieved from Commercial Fishery Statistics: http://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/applications/trade-by-product

[10] World Trade Organization. (2015). *United States of America and the WTO*. Retrieved from Member Information: https://www.wto.org/english/thewto_e/countries_e/usa_e.htm

[11] U.S. Food and Drug Administration. (2015, June 9th). *Import Alert 16 - 129*. Retrieved from http://www.accessdata.fda.gov/cms_ia/importalert_31.html

[12] U.S. Food and Drug Administration. (2015, June 9th). *Import Alert 16 - 129*. Retrieved from http://www.accessdata.fda.gov/cms_ia/importalert_31.html

[13] "Shrimp Import Legislation for Sea turtle Conservation" *NOAA Fisheries.* Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/turtles/shrimp.htm

[14] 16 U.S.C. 1537 http://www.gpo.gov/fdsys/pkg/USCODE-2011-title16/html/USCODE-2011-title16-chap35-sec1537.htm

[15] *Federal Register*. Web. Accessed November 2015. https://www.federalregister.gov/articles/2015/05/27/2015-12750/certifications-pursuant-to-section-609-of-public-law-101-162

[16] World Trade Organization. (1998). *Case DS58 US Shrimp.* Geneva: World Trade Organization. https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds58_e.htm

[17] National Oceanic and Atmospheric Administration. (2015, June 17th). *NOAA Fisheries*. Retrieved from Presidential Initiative on Combating Illegal, Unreported, and Unregulated (IUU) Fishing and Seafood Fraud: http://www.fisheries.noaa.gov/ia/iuu/taskforce.html

[18] Center for Food Safety. (2014, December). *Seafood Safety and the Trans-Pacific Partnership (TPP).* Retrieved from Center for Food Safety: http://www.centerforfoodsafety.org/files/tpp-and-seafood-fact-sheet_00590.pdf

[19] National Oceanic and Atmospheric Administration. (2015, June 17th).

[20] Department of Commerce. (2013, January 18th). *Commerce Initiates Countervailing Duty Investigations of Certain Frozen Warmwater Shrimp from the People's Republic of China, Ecuador, India, Indonesia, Malaysia, Thailand, and the Socialist Republic of Vietnam.* Retrieved from International Trade Administration: http://enforcement.trade.gov/download/factsheets/factsheet_multiple-shrimp-cvd-init-20130118.pdf

[21] Murphy, S. (2015, April 6th). *U.S. Rejects COGSI Countervailing Duty Appeal.* Retrieved from Seafood Source News: http://www.seafoodsource.com/news/supply-trade/27930-u-s-court-rejects-cogsi-shrimp-countervailing-duty-appeal

[22] H.R. 1907 – Trade Enforcement and Facilitation Act of 2015, Sec. 421

Article 12 - Fisheries Research

12.1 Responsible fishing requires the availability of a sound scientific basis to assist fisheries managers and other interested parties in making decisions, taking into account the special needs of developing countries.

(a) Is appropriate research conducted into all aspects of fisheries, including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA Fisheries is responsible for Gulf-wide research on fisheries, including biological, ecological, technology, and socioeconomics. NOAA's SEFSC, based in Miami, FL, is the branch responsible for providing multi-disciplinary research to support management decisions of the GMFMC and NOAA Fisheries.[1] GSMFC also contributes to research on Gulf of Mexico Fisheries through the SEAMAP and		

Fisheries Economic Data Programs.[2] For details on SEFSC and GSMFC research pertaining to the resource, environment, and socioeconomics, see responses to 7.1.7 (a) and 7.4.2 (i) - 7.4.2 (iii). LDWF supports a wide range of ongoing research covering all aspects of fisheries management including biological, ecological, economic, socio-cultural, and aquaculture science. Research on the resource and environmental factors are carried out through LDWF's fishery independent monitoring program and trip ticket program.[3,4] For details on these programs, refer to the response to 7.1.7 (a). LDWF also maintains a Socioeconomic Development and Research Section, which conducts socioeconomic research on Louisiana fisheries. For details on LDWF's socioeconomic research, refer to the response to 7.4.2 (iii). LDWF also collaborates on environmental, coastal and fisheries related research with other government agencies including LDEQ, LDNR, LDHH, CRPA, NOAA, and USFWS, as well as academic and research institutions such as the Louisiana State University (LSU) Coastal Fisheries Institute, Louisiana Sea Grant and LUMCON.[5,6] The LSU AgCenter Aquaculture Research Center houses 146 experimental ponds and Scientists conduct research on catfish, oysters, alligators, baitfish, turtles, a variety of freshwater game fish and crawfish.[7] Nutritional science is researched by national organizations such as the USFDA and academic institutions such as the Louisiana State University School of Nutrition and Food Sciences.[8,9] Nutritional information is disseminated by the LUS AgCenter including brochures on health benefits of seafood and methods on purchasing, handling and storing seafood.[10] Nutritional information also distributed by the Gulf States Marketing Coalition as a part of the GSMFC Oil Disaster Recovery Program (ODRP) program.[11,12] The LSU AgCenter and Louisiana Sea Grant also provide scientific and technical guidance to the Louisiana seafood industry to assist industry in maintaining compliance with state and federal regulations and best practices in post-harvest handling and processing.[13,14]		

[1] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[2] *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/

[3] SEDAR 27-RD-06 "Fishery Independent Sampling: Louisiana" Southeast Data, Assessment, and Review. http://sedarweb.org/docs/wsupp/S27_RD_06_LDWF_independent.pdf

[4] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

[5] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[6] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

[7] "Aquaculture Research Station" *LSU AgCenter.* Web. Accessed November 2015. http://www.lsuagcenter.com/en/our_offices/research_stations/aquaculture/

[8] "Center for Food Safety and Applied Nutrition" *U.S. Food and Drug Administration*. Web. Accessed November 2015. http://www.fda.gov/aboutfda/centersoffices/officeoffoods/cfsan/default.htm#

[9] Louisiana State University School of Nutrition and Food Sciences. Web. Accessed November 2015. http://nfs.lsu.edu/

[10] LSU AgCenter. *Health Benefits of Seafood*. Brochure. http://www.lsuagcenter.com/NR/rdonlyres/F67F68CF-0B40-48F6-9404-01F5D97791CC/38201/pub2987seafoodhealthbenefitsHIGHRES.pdf

[11] *Gulf Seafood Marketing Coalition*. Web. Accessed September 2015. http://eatgulfseafood.com/userfiles/file/Nutritional%20Guide.pdf

[12] "Oil Disaster Recovery Program. *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/odrp.php

[13] "Seafood Safety Workshops" *LSU AgCenter*. Web. Accessed September 2015. http://www.lsuagcenter.com/news_archive/2015/november/headline_news/lsu-agcenter-announces-seafood-safety-workshops.htm

[14] "Sanitation control Measures for Fish and Fishery Products" Louisiana Sea Grant. Web. Accessed September 2015.http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwiqp5S4n8jJAhVHqYMKHcK_ADkQFgguMAM&url=http%3A%2F%2Fwww.laseagrant.org%2Fevent%2Fscp-training%2F&usg=AFQjCNFk-erm6QWES2dOuLCuaoRwqWsliQ&bvm=bv.108538919,d.amc

12.1 (b) Are research vessel surveys of the resource and the marine environment carried out?
Annually...[1] **Occasionally...**[½] **No...**[0]

Extent of compliance		
Annually	**Occasionally**	**No**
Federal: NOAA Fisheries SEFSC conducts resource surveys in the Gulf of Mexico through the Mississippi Labs.[1] Annual surveys include groundfish surveys, longline surveys, marine mammal surveys, plankton surveys, and reef fish surveys. Groundfish surveys have been conducted since the 1950s and consist of two bottomfish trawl surveys (summer and fall) and a small pelagic trawl survey in winter.[2] Longline surveys occur yearly utilizing commercial longline gear.[3] Plankton surveys are conducted throughout the year sampling for fish eggs, larvae and juveniles and their zooplankton predators and prey; Winter surveys focusing on grouper and tilefish species, Spring surveys focus on bluefin tuna, and Fall surveys focusing on spawning fish such as red drum, mackerels and snappers.[4] Sampling is conducted using a variety of gear types including bongo nets, neuston nets,		

CUFES, MOCNESS and Methot trawls. Fishery-independent data collected through resource surveys provides a valuable time-series to monitor trends in resource abundance and is utilized in NOAA stock assessments and other research programs.

SEAMAP- Gulf of Mexico also conducts resource surveys that are used to assess the shrimp fishery through the Summer and Fall Shrimp/Groundfish Surveys.[5] Objectives include (but are not limited to):

- Monitoring penaeid shrimp size and distribution
- Evaluating the "Texas Closure" portion of GMFMC's FMP
- Providing data on shrimp and groundfish stocks
- Obtaining measurements to determine population size structures

Other annual SEAMAP resource surveys include the Spring Plankton Survey, Reef Fish Survey, Fall Plankton Survey and plankton and environmental data surveys. SEAMAP-Gulf produces Environmental and Biological Atlases, which include information on dominant finfish and invertebrate catches from surveys, environmental data and survey methodology. Additionally, SEAMAP may participate in other projects such as the Fish Tagging Cruise, and coordinating finfish bycatch estimates.

Louisiana:

The fishery independent monitoring program in Louisiana was initially developed based on the methodologies utilized by the Cooperative GMEI conducted in cooperation with the GSMFC.[6] The standardized methods and procedures of GMEI were developed by the GSMFC TCC. In 2010, sampling locations were revised due to changes in Louisiana's coastline from land loss and methodologies were altered to include a stratified random design to improve sampling coverage. Historical CSAs were modified into five hydrological basins for monitoring activities and regular sampling is conducted monthly with additional sampling added seasonally for specific needs.[7] Shrimp abundance, using several types of trawl gear, is sampled throughout the year along with environmental and hydrological data at each sampling site. The database of trawl sampling for shrimp by the Marine Fisheries Section dates back to the 1960s and standardized sampling protocols are documented in the Sampling Procedures Manual utilized by LDWF personnel.

[1] "Mississippi Labs: Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[2] "Groundfish Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/groundfish.htm

[3] "Longline Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/longline.htm

[4] "Plankton Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/plankton.htm

[5] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[6] SEDAR 27-RD-06 "Fishery Independent Sampling: Louisiana" Southeast Data, Assessment, and Review. http://sedarweb.org/docs/wsupp/S27_RD_06_LDWF_independent.pdf

[7] LDWF. *Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs*. June 2015

12.1 (c) Are appropriate research and training facilities available and provisions made for staffing and institution building to conduct the necessary research? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The NOAA SERO is located in St. Petersburg, Florida. NOAA SEFSC has laboratory locations in Beaufort, NC; Galveston, TX; Lafayette, LA; Miami, FL; Panama City, FL; Pascagoula, MS; and Stennis Space Center, MS.[1] For certain programs, such as the Observer Program, NOAA Fisheries may also make use of private companies to recruit, hire, and deploy observers. These observers are highly trained according to strict guidelines set by the SEFCS Galveston Laboratory.[2] The GMFMC headquarters is located in Tampa, FL.[3] The GSMFC is located in Ocean Springs, MS.[4] **Louisiana:** LDWF's primary fisheries research lab is located in Grand Isle with additional locations in each of the study areas around the state to conduct monitoring and research throughout the coast.[5] The Grand Isle Lab opened in 2009 and serves as the headquarters of research for the Office of Fisheries. Biologists at the lab conduct research on a variety of marine species including finfish, crab, shrimp, sharks and oysters and their associated habitat.[6] LDWF Office of Fisheries also contains a Socioeconomic Research and Development Section to conduct social and economic research on important commercial and recreational fisheries. LDWF also contracts with universities within Louisiana to conduct specific studies.		

[1] "About Us" *NOAA Southeast Regional Office*. Web. Accessed November 2015. http://sero.nmfs.noaa.gov/about_us/what_we_do/index.html

[2] NMFS. Observer Training Manual: Characterization of the US Gulf of Mexico and Southeastern Atlantic Otter Trawl and Bottom Reef Fish Fisheries. September 2010. https://www.st.nmfs.noaa.gov/Assets/Observer-Program/pdf/Shrimp_Reef_fish_Manual_9_22_10.pdf

[3] "Contact Us" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/contact.php

[4] "Contact Us" *Gulf State Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/contact.php

[5] "Grand Isle Lab" *Louisiana Department of Wildlife and Fisheries*. Web. Accessed November 2015. http://www.wlf.louisiana.gov/facility/grand-isle-fisheries-research-lab

[6] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

12.2 Has an appropriate institutional framework been established to determine the applied research which is required and its proper use? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC maintains a SSC charged with providing scientific advice to the Council.[1] The SSC is responsible for advising the Council on the adequacy of scientific information and analyses for proposed management measures and alternatives. The SSC reviews FMPs and amendments, including EISs, EAs, and RIRs and provides a determination of whether these are based on the best scientific evidence available. The SSC establishes research priorities based on management needs and submits these to NOAA SEFSC.[2] Research is then carried out by SEFSC's various labs and research programs across the Gulf to meet these needs.[3] **Louisiana:** LDWF organizational structure is designed to develop management strategies, determine research needs, conduct research based on those needs, utilize the results of research in management decisions, and ensure enforcement of adopted regulations.[4] LWFC and LDWF are mandated to conduct the necessary research to properly manage the fisheries of Louisiana by the Louisiana Revised Statutes, Title 56.[5] Academic institutions and non-government organizations are also often utilized for applied research on coastal or fisheries issues. LDWF scientists also participate in applied research for regional organizations, including GSMFC and GMFMC.		

[1] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[2] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[3] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[5] La. R.S. 56 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/34690-title-56/2010title56complete.pdf

12.3 (a) Are data generated by research being analyzed and the results of such analyses published in a way that confidentiality is respected where appropriate? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
GMFMC, GSMFC and LDWF each maintain strict confidentiality requirements in compliance with state and federal laws. For full details, refer to 7.4.7 response. NOAA stock assessments, FMPs and other reports are reviewed by the GMFMC SSC and are published on the GMFMC website in accordance with the confidentiality requirements. GSMFC research is peer-reviewed and published on the GSMFC website. Summaries of non-confidential data are disseminated to the public and other agencies. LDWF publishes FMPs and research and monitoring results on the LDWF website.		

12.3 (b) Are results of analyses being distributed in a timely and readily understandable fashion in order that the best scientific evidence be made available as a contribution to fisheries conservation, management and development? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The GMFMC meeting minutes, stock assessments, scientific reports and other publications are made available online through their website and are also available in writing through public records requests.[1] The GMFMC also provides briefing materials through their website for committee members and general public to access prior to each meeting.[2] Timelines vary for documents posted in briefing folders depending upon the project but are typically posted a few weeks prior to the meeting for documents being referenced. Meeting minutes from the most recent prior council meeting appear in the briefing folder for the next upcoming council meeting (council meetings occur five times a year and generally fall about two months apart.) The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research and publishes summary reports and analyses.[3] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. All data are entered into the FIS Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies. Additional information for shrimp is gathered through the GSS, which includes data collection by port agents stationed throughout the Gulf of Mexico.[4] Weekly reports are posted on the NOAA Fisheries Statistics website documenting Gulf shrimp landings by area and species, and ex-vessel price and landings. A monthly Gulf Coast Shrimp Statistics report is also		

posted.[5] GSMFC publishes reports and assessments as soon as possible once approved by the commission. These reports are posted online in the publications area of the GSMFC website.[6] Notification of availability is sent to newspapers and local media as well as posted on GSMFC and state agency social media and web pages and is announced in the GSMFC quarterly newsletter. Meeting minutes and records are compiled into a 'draft minutes book' twice a year after both the spring and fall annual meetings and sent to the commissioners and meeting participants within 2-3 months. All GSMFC meeting minutes are collated by year and published annually on the website. Documents that are not immediately available on the website can be requested directly from GSMFC and are provided within one week of the request. LDWF raw data are available immediately to resource managers as needed for use in management decisions. Data are analyzed in trends reports and reviewed by LDWF staff regularly. Analyzed reports are disseminated throughout the agency in a timely manner for in-house use and reporting. Non-confidential information and summaries are made available to other agencies and non-governmental institutions and published in scientific reports and FMPs.[7,8,9] Special studies conducted by LDWF scientists may also be published in scientific journals and presented at conferences when relevant. Contact information is provided for primary authors or principle investigators of published reports for further inquiry.		

[1] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

[2] "Council Meeting Briefing Books" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/council_meeting_briefing_books.php

[3] "Fisheries Statistics" NOAA Southeast Fisheries Science Center. Web. Accessed November 2015. http://www.sefsc.noaa.gov/about/statistics.htm

[4] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[5] "Commercial Fisheries Statistics" *NOAA Office of Science and Technology*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[6] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[7] "Stock Assessments" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/stock-assessments

[8] "Research Results" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/fishing/research-results

[9] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

12.3 (c) In the absence of adequate scientific information, is appropriate research being initiated in a timely fashion? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC maintains a SSC charged with providing scientific advice to the Council.[1] The SSC is responsible for advising the Council on the adequacy of scientific information and analyses for proposed management measures and alternatives. The SSC establishes research priorities based on management needs and submits these to NOAA SEFSC.[2] Research is then carried out by SEFSC's various labs and research programs across the Gulf to meet these needs.[3] **Louisiana:** LDWF continually strives to keep pace with changing research priorities as a result of fluctuating fisheries dynamics and needs. Resource monitoring and regular review of harvest and resource data highlights changing research needs and provides a basis for research priorities. LDWF works closely with academic institutions such as LSU to supplement research capabilities and fulfill research needs. The Louisiana Shrimp FMP highlights current research needs and options for management consideration.		

[1] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[2] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[3] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

12.4 (a) Are reliable and accurate data required to assess the status of fisheries and ecosystems - including data on bycatch, discards and waste - being collected? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA Fisheries is responsible for assessing and managing Gulf shrimp fisheries. NOAA SEFSC is the branch responsible for providing multi-disciplinary research to support management decisions of the GMFMC and NOAA Fisheries.[1] SEFSC Research and Data programs are responsible for biological, economic and socio-cultural research and data collection for commercial and recreational fisheries, economics and fisheries-independent data. For full details on NOAA's data		

collection programs, including port agents, trip tickets, and required reporting by fishermen, refer to the responses to 7.4.6 and 7.1.7 (a).

Amendment 13 of the Shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition.[2] These methods include the implementation of an ELB for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition. The Electronic Logbook (ELB) Program and the Observer Program are run by the Galveston Lab.[3,4] Both programs became mandatory in 2007 and, if selected, Gulf shrimp permit holders are required to participate in these programs and permit renewal is contingent upon participation. Permit holders are selected by the Southeast Regional Director through a stratified random sampling method. The ELB program collects data on amount and location of shrimp landings. The focus of data collection for the shrimp fishery Observer Program is bycatch and BRD evaluation.[5] The Observer Program evaluates TEDs and bycatch reduction devices (BRDs), quantifies bycatch and characterizes bycatch species composition. The Galveston Lab regularly publishes research on the shrimp fishery and contributes data and research results to the National Observer Program, which also produces reports biannually. Bycatch data from the observer and ELB programs is also utilized by the SEDAR process when conducting stock assessments of other species.[6] The most recent report on shrimp otter trawl bycatch (Scott-Denton et al. 2012) from the Galveston Lab determined that total bycatch to shrimp ratio had decreased to 2.5:1 for total bycatch to shrimp and 2:1 for finfish to shrimp.[7] Characterization of bycatch composition from this report shows that the majority of species are finfish, but some crustaceans including blue crabs and other shrimp species like seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*), and sea turtles are also known bycatch species.[8] This bycatch species composition is consistent with other shrimp trawl bycatch studies conducted within the Gulf of Mexico (Adkins, 1993 in Louisiana, Burrage 2002 in Mississippi, and Fuls et. al 2002 in Texas). Based on a recent analysis by Raborn et al. (2014) the only species (or species group) that represent 5% or higher in shrimp trawl bycatch are Atlantic croaker, seatrouts, longspine porgy, and inshore lizardfish. Analysis of these species indicates that shrimp trawl bycatch does not pose a threat to their populations.[9] One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the ESA, which includes five species of sea turtles, smalltooth sawfish, and Gulf sturgeon.[10] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. USFWS and NOAA Office of Protected Resources are responsible for research and assessment of species on the endangered species list and assessments and recovery plans are updated every five years.[11] NOAA is also required to consult on activities that may impact endangered species and has produces several Biological Opinions relating to sea turtles and the shrimp trawl fishery in the Gulf of Mexico. The most recent biological opinion was published in 2014 and authorizes the continued operation of the shrimp trawl fishery.[12] A new consultation (resulting in a biological opinion) is initiated if there is new

information or an action is modified that has not previously been considered, or if an incidental take statement is exceeded. Promoting consistency with the ESA and MMPA, and minimizing incidental capture of finfish species are two major objectives of the GMFMC Shrimp FMP.[13] **Louisiana:** LDWF does not conduct stock assessments specific to shrimp in Louisiana waters because shrimp stocks extend across jurisdictional boundaries throughout the Gulf of Mexico and are assessed regionally by NOAA Fisheries. LDWF, however, does closely monitor shrimp abundance and fishery operations in state waters to support management decisions and contributes data to NOAA Fisheries for regional assessment activities. LDWF collects data on the shrimp fishery through the fishery independent monitoring program and trip ticket program.[14,15] For details on these programs, refer to the response to 7.1.7 (a).		

[1] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[4] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[5] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[6] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[7] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[8] National Marine Fisheries Service. 2011.

[9] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[10] NMFS. 2012. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/fisheries_bo/southeastshrimpbiop_final.pdf

[11] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[12] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[13] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[14] SEDAR 27-RD-06 "Fishery Independent Sampling: Louisiana" Southeast Data, Assessment, and Review. http://sedarweb.org/docs/wsupp/S27_RD_06_LDWF_independent.pdf

[15] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

12.4 (b) Are these data being provided, at an appropriate time and level of aggregation, to relevant States and subregional, regional and global fisheries organizations? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC utilizes data collected through NOAA Fisheries and each of the five Gulf state management agencies. GMFMC maintains a standing Data Collection Committee, which "reviews and advises the Council on the data requirements for managing each fishery, the statistical methodology needed, and on all issues related to data and data collection."[1] The SEFSC Fisheries Statistics Division collects data on the Gulf of Mexico shrimp fishery through required reporting of landings data by dealers and fishermen, port agent interviews, and independent research.[2] Landings data are collected by the SEFSC Fisheries Monitoring Branch from each individual state agency Trip Ticket Reporting Program. All data are entered into the FIS Metadata Catalog and are accessible by NOAA Fisheries and each of the Gulf state agencies. Data are submitted to each state agency by dealers on a monthly basis. Additional information for shrimp is gathered through the GSS.[3] Port agents are responsible for collecting both landings data from seafood dealers and interview data from either the captain or a member of the crew and data entry into the GSS is ongoing as information is collected. Data collected by port agents include amount and value of shrimp landed, fishing effort, and locations fished. Weekly reports are posted on the NOAA Fisheries Statistics website documenting Gulf shrimp landings by area and species, and ex-vessel price and landings. A monthly Gulf Coast Shrimp Statistics report is also posted.[4] Additionally, all federal Gulf shrimp permit holders are required to report annual landings each year through the ALF as a condition for permit renewal.[5] Data are also collected on the shrimp fishery through the		

Electronic Logbook (ELB) Program and the Observer Program.[6,7] The new cELB program, which began in 2014, transmits the most recent data from vessels directly to the Galveston Lab whenever the vessel is within cellular range. Observer coverage is compiled into annual reports made available to federal and state fisheries managers and posted publically on NOAAs website. NOAA Fishery-Independent Resource Surveys are conducted through the SEFSC Mississippi Labs. Shrimp/Bottomfish surveys are conducted each fall and summer, which are designed to provide a time-series for monitoring trends in resource abundance.[8] Data are made available to both state and federal resource managers. GSMFC: Fishery-related and other supporting scientific data are gathered individually by each state's management agency and submitted and reviewed regularly by GSMFC. The GSMFC meets twice a year (March and October) to review scientific data and regional management activities. Data on fishery trends in landings, values, and other activities of the fishery are presented by each state and reviewed at each meeting. The GSMFC IJF program also collects data regularly for regional assessments and FMP updates of stocks not covered by federal FMPs; data are submitted by the states on request based on the needs of specific projects. GSMFC FMPs are reviewed every five years and updated at intervals determined by the TCC.[9] GSMFC data collection programs specific to the shrimp industry include the SEAMAP Gulf of Mexico Resource Surveys and the Fisheries Economic Data Program, among others.[10,11] **Louisiana:** LDWF data collection occurs through a series of programs including the Trip Ticket Program and the fishery independent monitoring program.[12,13,14] These programs gather the necessary information on total catch, gear and fishing methods, vessel information, location, date, length of trip, and effort data, as well as biological information of the species including age, growth, recruitment, distribution, abundance surveys and environmental factors. Data from both programs are submitted regularly to regional organizations, such as GSMFC and GMFMC, as needed for reports and assessments. Summaries of non-confidential information are made available to the public.[15,16]		

[1] GMFMC, 2012. Gulf of Mexico Fishery Management Council Statement of Organization Practices and Procedures. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SOPPs.pdf

[2] SEFSC Fisheries Statistics Division http://www.sefsc.noaa.gov/about/statistics.htm

[3] "Gulf Shrimp" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/fisheries/gulfshrimp.htm

[4] "Fisheries Statistics" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/st1/market_news/

[5] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[6] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[7] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[8] "Mississippi Labs: Surveys" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/surveys/index.htm

[9] VanderKooy, Steve. GSMFC. Personal Communication. August, 2014.

[11] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[12] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[13] LDWF. *Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs.* June 2015

[14] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 15 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[15] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

[16] "Publications" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/publications.php

[17] "Resource Library" *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/resources/resource_library.php

12.5 (a) Are States monitoring and assessing the state of the stocks under their jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA SEFSC Galveston Lab conducts ongoing monitoring and research for the Gulf of Mexico shrimp fishery and produces the following reports: closure analysis reports for the Texas and Tortugas closure areas, stock assessment reports, shrimp stock trend analysis reports, recruitment overfishing monitoring reports, growth overfishing analysis reports, shrimp effort estimation and analysis reports and YPR analysis reports.[1] **Louisiana:** LDWF regularly monitors shrimp abundance within state jurisdiction through the fishery independent monitoring program and harvest data are collected through the		

Trip Ticket Program.[2,3,4] Pollution and habitat alteration are highly regulated and monitored through the LDEQ, CPRA coastal programs, LDNR Office of Coastal Management and U.S. Army Corps of Engineers (USACE).[5,6,7,8]		

[1] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[2] LDWF. *Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs.* June 2015

[3] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 15 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[4] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

[5] *Louisiana Department of Environmental Quality*. Web. Accessed November 2015. http://www.deq.louisiana.gov/portal/

[6] *Coastal Protection and Restoration Authority.* Web. Accessed November 2015. http://coastal.la.gov/about/

[7] *LDNR Office of Coastal Management*. Web. Accessed November 2015. http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=85&ngid=5

[8] *USACE New Orleans District.* Web. Accessed November 2015. http://www.mvn.usace.army.mil/

12.5 (b) Have they established the research capacity necessary to assess the effects of climate or environment change on fish stocks and aquatic ecosystems? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: NOAA Fisheries conducts research on climate change and fisheries.[1,2] In March 2015, NOAA Fisheries released a draft Climate Science Strategy (NCSS) for public comment. This strategy is designed to collect and provide information on changing climate and ocean conditions to better prepare for and respond to climate-related impacts.[3] The NCSS includes the following objectives: - Objective 1: Identify appropriate, climate-informed reference points for managing living marine resources (LMRs). - Objective 2: Identify robust strategies for managing LMRs under changing climate conditions. - Objective 3: Design adaptive decision processes that can incorporate and respond to changing climate conditions. - Objective 4: Identify future states of marine and coastal ecosystems, LMRs, and LMR-dependent human communities in a changing climate. - Objective 5: Identify the mechanisms of climate impacts on LMRs, ecosystems, and LMR-dependent human communities.		

- Objective 6: Track trends in ecosystems, LMRs and LMR-dependent human communities and provide early warning of change.
- Objective 7: Build and maintain the science infrastructure needed to fulfill NOAA Fisheries mandates with changing climate conditions.

For each of the objectives listed, there are specific actions identified to help achieve that objective within the strategy. The NCSS also includes a set of priority recommendations.

NOAA conducts monitoring, research, modeling and assessment activities to inform fisheries management and protected resources in a changing environment. The Fish Stock Climate Vulnerability Assessment is currently being used to identify which stock may be most vulnerable to climate change, identifying areas where more data are needed, and providing a basis for actions that can be taken to reduce impacts.[4]

NOAA Fisheries Climate website provides a series of tools currently available regarding climate resilience including OCEANADAPT, which is a web-based tool developed through a partnership between NOAA Fisheries and Rutgers University that provides information about the distribution of commercially and recreationally important marine species over time.[5,6]

The SEFSC recently published the Ecosystem Status Report for the Gulf of Mexico in December 2013. This report includes information on climate drivers and physical pressures on the Gulf of Mexico ecosystem as well as fishing indicators.[7]

Louisiana:

The fishery independent monitoring program conducted by LDWF includes collection of environmental and climatic measurements at each sample site.[8,9] Parameters measured include air and water temperature, salinity, water transparency, dissolved oxygen and conductivity. Standardized sampling data from the fishery independent monitoring program ranges back to the 1960's allowing for analysis of long term trends in stock abundance and environmental conditions.[10]

Louisiana also participates in regional sampling programs including SEAMAP, which provide additional fishery independent data to enhance scientific evidence used in management decisions.[11] The SEAMAP surveys follow similar standardized procedures and include collection of environmental parameters at each sample site.

[1] "Climate Portal" *NOAA Fisheries*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/stories/2014/03/climate_portal.html

[2] NOAA Fisheries. *Fish Stock Climate Vulnerability Assessment*. http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/Fish_Stock_Climate_Vulnerability_Assessment.pdf

[3] NOAA Fisheries. *Draft Climate Science Strategy*. January 2015. http://www.st.nmfs.noaa.gov/Assets/ecosystems/climate/documents/draft_NOAA%20Fisheries_Climate_Science%20Strategy_Jan_2015.pdf

[4] "Assessing the Vulnerability of Fish Stocks in a Changing Climate" *NOAA Fisheries*. Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/ecosystems/climate/activities/assessing-vulnerability-of-fish-stocks

[5] "Climate Tools" *NOAA Office of Science and Technology.* Web. Accessed November 2015. http://www.st.nmfs.noaa.gov/ecosystems/climate/tools/index

[6] *Ocean Adapt*. Web. Accessed November 2015. http://oceanadapt.rutgers.edu/

[7] Mandy Karnauskas, Michael J. Schirripa, Christopher R. Kelble, Geoffrey S. Cook and J. Kevin Craig. *Ecosystem Status Report for the Gulf of Mexico*. NOAA Technical Memorandum NMFS-SEFSC-653. December 2013. http://gulfcouncil.org/docs/Gulf%20of%20Mexico%20Ecosystem%20Status%20Report.pdf

[8] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. p. 15 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[9] LDWF. *Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs*. June 2015

[10] SEDAR 27-RD-06 "Fishery Independent Sampling: Louisiana" Southeast Data, Assessment, and Review. http://sedarweb.org/docs/wsupp/S27_RD_06_LDWF_independent.pdf

[11] "SEAMAP Gulf of Mexico Resource Surveys" *Southeast Area Monitoring and Assessment Program*. Web. Accessed Nov. 2015. http://www.gsmfc.org/seamap-gomrs.php

12.6 Are states taking steps to support and strengthen research capabilities to meet acknowledged scientific standards? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA (first enacted in 1976, and amended in 1996 and 2006) is the primary law governing fisheries management in the U.S.[1] The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management. National Standard 2 (NS2) requires that "*Conservation and management measures shall be based upon the best scientific information available.*"[2] The MSA, section 302(g)(1)(A) requires each regional management council to form a SSC to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[3] The SSC typically includes economists, biologists, sociologists and natural resource		

attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf states. The SSC establishes research priorities based on management needs and submits these to NOAA SEFSC.[4] Research is then carried out by SEFSC's various labs and research programs across the Gulf to meet these needs.[5] **Louisiana:** LDWF regularly reviews scientific protocols and methods and updates procedures as necessary to keep pace with advances in fisheries science. LDWF continues enhance research capabilities with the on-going development of the Grand Isle Laboratory, which opened in 2009, and the current proposal underway for the Louisiana Marine Fisheries Enhancement, Research and Science Center, which would utilize funding from the BP oil spill restoration funds to add two new research facilities (one in Calcasieu Parish and one in Plaquemines Parish).[6,7] LDWF may also contract with academic institutions such as LSU for specific research needs. LDWF scientists attend workshops and conferences to stay up-to-date on current research methods within their field, and participate in regional organizations, including GSMFC and GMFMC to collaborate on scientific research.[8,9]		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[4] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[5] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[6] "Grand Isle Lab" *Louisiana Department of Wildlife and Fisheries.* Web. Accessed November 2015. http://www.wlf.louisiana.gov/facility/grand-isle-fisheries-research-lab

[7] Louisiana Marine Fisheries Enhancement, Research and Science Center proposal http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/Fish_Hatchery_Factsheet_finalproof.pdf

[8] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[9] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/

12.7 (a) Are states cooperating with relevant regional organizations to encourage research in order to ensure optimum utilization of fishery resources? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA, which is the primary law governing fisheries management in the U.S. The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management.[1] National Standard 1 (NS1) requires "*Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.*"[2] Current guidelines for NS1 require specification of MSY and OY, based on the best scientific evidence available, for each fishery managed by the Councils. Additionally, NS1 requires specification of SDC so that overfishing and overfished determinations can be made for stocks in the fishery. The NS1 guidelines are designed to prevent overfishing and ensure that the fishery achieve OY and require corrective actions to be taken to rebuild stocks if overfishing or overfished conditions occur. The GMFMC implemented the Shrimp FMP in 1981, which currently includes brown shrimp, white shrimp, pink shrimp, and royal red shrimp in the Gulf of Mexico.[3] The goals/objectives of the Shrimp FMP include optimizing the yield of shrimp recruited to the fishery. Amendment 5 of the Shrimp FMP defined overfishing and provided measures to restore overfished stocks, should overfishing occur, for brown, pink and royal red shrimp, and Amendment 7 similarly defined overfishing and measures to restore stocks if overfished for white shrimp.[4,5] Amendment 13 further defined reference points for each of the penaeid shrimp species to comply with the requirements of MSA NS1 and includes definitions of MFMT and MSST[6] The GMFMC manages the shrimp fishery in relation to these reference points to ensure optimal yield and long-term availability for future generations. Louisiana participates in research to support optimal utilization of resources regionally through GMFMC.[7] Though there is currently no formal cooperation with respect to the shrimp fishery, there is cooperation between the United States and Mexico regarding fisheries management in the Gulf of Mexico. The United States-Mexico Fisheries Cooperation Program is a bilateral consultative agreement that was informally agreed upon by the NMFS and SAGARPA in 1983.[8] Three MOU have been formalized through this relationship including the MEXUS-Golfo research program. FCTs between NMFS and CONAPESCA occur annually and MEXUS-Golfo working groups are held as needed. Recent FCT meetings have included discussion of sustainable fisheries management, protection and conservation of species such as sea turtles, enforcement cooperation, aquaculture, collaborative research and participation in fisheries related international organizations.		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php http://gulfcouncil.org/fishery_management_plans/shrimp_management.php

[4] GMFMC. *Amendment 5 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*.1991. http://gulfcouncil.org/Beta/GMFMCWeb/downloads/SHRIMP%20Amend-05%20Draft%201991-01.pdf

[5] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[6] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[7] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://www.gulfcouncil.org/

[8] NOAA. 2014. *International Agreements Concerning Living Marine Resources of Interest to NOAA Fisheries*. http://www.nmfs.noaa.gov/ia/intlagree/docs/2012/international_agreements.pdf

12.7 (b) Are they stimulating the research required to support national policies related to fish as food? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Unites States Code, Title 21, Part 123 and Part 110 establish a mandatory seafood inspection program (HACCP) and quality standards for the manufacture, packing and storing of food for human consumption.[1,2] The FDA maintains a Science and Research (Food) Program that continues to advance knowledge regarding potential food hazards, best practices for handling and preparation, and consumer use of foods, including seafood.[3] The FDA conducts seafood testing to ensure safety and has produced several reports on testing of Gulf seafood conducted after the 2010 Deepwater Horizon Oil Spill.[4] NOAA also conducts seafood testing, collecting samples of shellfish and sediment from over 60 sites across the Gulf of Mexico to test for chemical and microbial contaminants.[5] The USDA is also involved in food safety, security, quality standards, and nutrition.[6] USDA National Institute of Food and Agriculture (NIFA) supports research in many aspects of food and agriculture.[7] The USDA also provides dietary guidelines to advise consumers on health eating.[8] The GSMFC ORDP initiatives are currently working to support national policies		

related to fish as food by addressing Gulf seafood marketing, traceability, sustainability, and seafood safety issues. [9] **Louisiana:** At the state level, the Louisiana Department of Health and Hospitals (LDHH) Commercial Seafood Program is the regulatory and enforcement agency for all seafood products produced and processed in Louisiana.[10] LDHH conducts inspections of seafood facilities to ensure that HACCP and National Shellfish Sanitation Program (NSSP) quality standards and requirements are being met. The LFF Program, a partnership between LDWF and Louisiana Sea Grant, provide education and training to seafood harvesters, dealers, and processors on best practices for handling seafood and regulations set by the FDA and other agencies.[11] Nutritional science is researched by the Louisiana State University School of Nutrition and Food Sciences.[12] Nutritional information is disseminated by the LSU AgCenter including brochures on health benefits of seafood and methods on purchasing, handling and storing seafood.[13] The LSU AgCenter and Louisiana Sea Grant also provide scientific and technical guidance to the Louisiana seafood industry to assist industry in maintaining compliance with state and federal regulations and best practices in post-harvest handling and processing.[14,15] LSPMB, authorized by Louisiana Revised Statutes 56:578.12, works to promote Louisiana seafood and inform the public regarding information on health, quality and safety of seafood from the Gulf of Mexico.[16,17] LDWF has also established the Louisiana Wild Seafood Certificate Program (LWSCP), which is a certification that guarantees the origin of Louisiana seafood products and provide consumer confidence in the quality and safety of seafood. The Seafood Technology Equipment Program supports LWSCP by assisting LWSCP participants with funding to increase quality of products.[18]		

[1] 21 U.S.C. 123 (FDA HACCP regulations) http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=123

[2] 21 U.S.C. 110 (Federal Food, Drug and Cosmetics Act) http://www.gpo.gov/fdsys/pkg/USCODE-2011-title21/html/USCODE-2011-title21-chap9-subchapIV.htm

[3] "Science and Research (Food)" *U.S. Food and Drug Administration*. Web. Accessed November 2015. http://www.fda.gov/Food/FoodScienceResearch/default.htm

[5] "Keeping Seafood Safe" *NOAA*. Web. Accessed November 2015. http://www.noaa.gov/100days/Keeping_Seafood_Safe.html

[6] *U.S. Department of Agriculture*. Web. Accessed November 2015. http://www.usda.gov/wps/portal/usda/usdahome?navid=food-nutrition

[7] "Research" *U.S. Department of Agriculture*. Web. Accessed November 2015. http://www.csrees.usda.gov/qlinks/research.html

[8] "Dietary Guidelines" *U.S. Department of Agriculture*. Web. Accessed November 2015. http://www.health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf

[9] "Oil Disaster Recovery Program" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/#:content@10:links@11

[10] "Commercial Seafood Program" *Louisiana Department of Health and Hospitals*. Web. Accessed November 2015. http://www.dhh.state.la.us/index.cfm/page/444/n/207

[11] *Louisiana Fisheries Forward*. Web. Accessed December 2015. http://lafisheriesforward.org/

[12] *Louisiana State University School of Nutrition and Food Sciences.* Web. Accessed November 2015. http://nfs.lsu.edu/

[13] LSU AgCenter. *Health Benefits of Seafood*. Brochure. http://www.lsuagcenter.com/NR/rdonlyres/F67F68CF-0B40-48F6-9404-01F5D97791CC/38201/pub2987seafoodhealthbenefitsHIGHRES.pdf

[14] "Seafood Safety Workshops" *LSU AgCenter*. Web. Accessed November 2015. http://www.lsuagcenter.com/news_archive/2015/november/headline_news/lsu-agcenter-announces-seafood-safety-workshops.htm

[15] "Sanitation control Measures for Fish and Fishery Products" *Louisiana Sea Grant.* Web. Accessed November 2015.http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwiqp5S4n8jJAhVHqYMKHcK_ADkQFgguMAM&url=http%3A%2F%2Fwww.laseagrant.org%2Fevent%2Fscp-training%2F&usg=AFQjCNFk-erm6QWES2dOuLCuaoRwqWsliQ&bvm=bv.108538919,d.amc

[16] *Louisiana Seafood Promotion and Marketing Board*. Web. Accessed November 2015. http://www.louisianaseafood.com/

[17] La. R.S. 56:578.12 http://law.justia.com/codes/louisiana/2012/rs/title56/rs56-578-12

[18] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Page 61. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

12.8 (a) Is research being conducted into the study and monitoring of human food supplies from aquatic sources and the environments from which they are taken to ensure that there is no adverse health impact on consumers? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
NOAA conducts seafood testing, collecting samples of shellfish and sediment from over 60 sites across the Gulf of Mexico to test for chemical and microbial contaminants.[1] The FDA also has authority to regulate seafood harvest and processing through the Food, Drug and Cosmetics Act and assists states with matters concerning sanitary quality of seafood through the Public Health Services Act.[2,3] In Louisiana, four state agencies are involved in seafood safety testing- LDWF,		

LDHH, LDEQ, and the Louisiana Department of Agriculture and Forestry (LDAF).[4] The Louisiana Seafood Safety Plan was developed after the BP oil spill and funded through 2014 provide enhanced sampling and disseminate results to the public through the Gulfsource website.[5] LDWF is responsible for biological and water and sediment samples collected inshore and nearshore; LDHH is responsible for processing and testing biological samples; LDEQ collects inshore water and sediment samples and coordinates samples from all agencies; and LDAF assists in processing and testing of samples.		

[1] "Keeping Seafood Safe" *NOAA*. Web. Accessed November 2015. http://www.noaa.gov/100days/Keeping_Seafood_Safe.html

[2] Guillory, V. Perry, H. VanderKooy, S. 2001. *The Blue Crab Fishery of the Gulf of Mexico, United States: A Regional Management Plan*. Gulf States Marine Fisheries Commission. Ocean Springs, MS. http://www.gsmfc.org/publications/GSMFC%20Number%20096.pdf

[3] "Seafood HACCP" *U.S. Food and Drug Administration*. Web. Accessed November 2015. http://www.fda.gov/Food/GuidanceRegulation/HACCP/ucm2006764.htm

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Page 55-56. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[5] *Gulfsource*. Web. Accessed December 2015. http://gulfsource.org/who-we-are.html

12.8 (b) Are results of such research being made publicly available? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
USFDA provides consumer updates on seafood through their website and via email updates.[1] Louisiana publishes results of seafood testing on the Gulfsource website, and within LDWF annual reports.[2,3] Fish consumption advisories are posted by LDHH and LDEQ.[4,5]		

[1] "Consumption Advisories" *U.S. Food and Drug Administration*. Web. Accessed November 2015. http://www.fda.gov/forconsumers/consumerupdates/ucm397443.htm

[2] *Gulfsource*. Web. Accessed December 2015. http://gulfsource.org/who-we-are.html

[3] LDWF. *Louisiana Department of Wildlife and Fisheries 2013-14 Annual Report.* Louisiana Department of Wildlife and Fisheries, Baton Rouge, LA. http://www.wlf.louisiana.gov/sites/default/files/pdf/publication/39247-2013-2014-annual-report/2013-2014_annual_report.pdf

[4] "Fish Consumption Advisories" *Louisiana Department of Health and Hospitals*. Web. Accessed November 2015. http://www.dhh.state.la.us/index.cfm/page/564

[4] "Fish Consumption Advisories" *Louisiana Department of Environmental Quality.* Web. Accessed November 2015.http://www.deq.louisiana.gov/portal/PROGRAMS/MercuryInitiative/FishConsumptionandSwimmingAdvisories.aspx

12.10 (a) Are studies on the selectivity of fishing gear, the environmental impact of fishing gear on target species and on the behavior of target and non-target species in relation to such fishing gear being conducted as an aid for management decisions? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Research is being conducted on selectivity of fishing gear and methods and programs are in place to monitor and assess potential impacts of fishing gear on target and non-target species. NOAA's Pascagoula Lab in Mississippi houses the Harvesting Systems Unit, a team of biologists and gear specialists who perform critical research on fishing gear. The Harvesting Systems Unit does extensive research on BRDs for the Gulf of Mexico shrimp fishery, including cooperative research with commercial industry members to test improved gear designs, and also conducts trainings and courtesy inspections across the Gulf on commercial shrimp boats to ensure proper use of TEDs and BRDs.[1] Current research being conducted by the Harvesting Systems Unit includes new TED designs for use in skimmer trawls. Amendment 13 of the Shrimp FMP, established bycatch reporting methodologies for the fishery to collect better information on the catch, effort, and bycatch composition.[2] These methods include the implementation of an ELB for a statistically significant portion of the fishery to improve data on effort, and mandatory requirements for observer coverage for a randomly selected portion of the fishery to collect data on effort and bycatch composition. The NOAA SEFSC Galveston Lab focuses research efforts on fishery management, fishery ecology and protected species with strong emphasis on research pertaining to all aspects of the shrimp fishery.[3] Data are collected on the shrimp fishery through the ELB Program and the Observer Program, managed by the Galveston Lab.[4] Both programs became mandatory in 2007 and, if selected, Gulf shrimp permit holders are required to participate in these programs and permit renewal is contingent upon participation. Permit holders are selected by the Southeast Regional Director through a stratified random sampling method. The ELB program collects data on amount and location of shrimp landings. The focus of data collection for the shrimp fishery Observer Program is bycatch and BRD evaluation.[5] The Observer Program evaluates TEDs and bycatch reduction devices (BRDs), quantifies bycatch and characterizes bycatch species composition. The Galveston Lab regularly publishes research on the shrimp fishery and contributes data and research results to the National Observer Program, which also produces reports biannually. Bycatch data from the observer and ELB programs is also utilized by the SEDAR process when conducting stock assessments of other species.[6] The most recent report on shrimp otter trawl bycatch (Scott-Denton et al. 2012) from the Galveston Lab determined that total bycatch to shrimp ratio had decreased to 2.5:1 for total bycatch to shrimp and 2:1 for finfish to shrimp.[7] Characterization of bycatch composition from this report shows that the majority of species are finfish, but some crustaceans including blue crabs and other shrimp species like seabobs (*Xiphopeneus kroyeri*), and rock shrimp (*Sicyonia brevirostris*), and sea turtles are also known bycatch species.[8] This		

bycatch species composition is consistent with other shrimp trawl bycatch studies conducted within the Gulf of Mexico (Adkins, 1993 in Louisiana, Burrage 2002 in Mississippi, and Fuls et. al 2002 in Texas). Based on a recent analysis by Raborn et al. (2014) the only species (or species group) that represent 5% or higher in shrimp trawl bycatch are Atlantic croaker, seatrouts, longspine porgy, and inshore lizardfish. Analysis of these species indicates that shrimp trawl bycatch does not pose a threat to their populations.[9]

One of the primary areas of focus for bycatch management in the shrimp trawl fishery has been on interactions with species listed under the ESA, which includes five species of sea turtles, smalltooth sawfish, and Gulf sturgeon.[10] As required under the rigorous requirements of the ESA, each species has a recovery plan and designation of critical habitat. USFWS and NOAA Office of Protected Resources are responsible for research and assessment of species on the endangered species list and assessments and recovery plans are updated every five years.[11] NOAA is also required to consult on activities that may impact endangered species and has produces several Biological Opinions relating to sea turtles and the shrimp trawl fishery in the Gulf of Mexico. The most recent biological opinion was published in 2014 and authorizes the continued operation of the shrimp trawl fishery.[12] A new consultation (resulting in a biological opinion) is initiated if there is new information or an action is modified that has not previously been considered, or if an incidental take statement is exceeded. Promoting consistency with the ESA and MMPA, and minimizing incidental capture of finfish species are two major objectives of the GMFMC Shrimp FMP.[13]

BOTTOM HABITAT IMPACTS:

Impacts on EFH are assessed by NOAA and the GMFMC in the Generic Amendment for addressing EFH requirements in FMPs. The EFH amendment applies to all seven GMFMC FMPs.[14] The initial EFH amendment was developed in 1998 and included an EIS. Section 5.1 identifies EFH for the shrimp species managed in the Gulf of Mexico Shrimp FMP (brown, white, pink, and royal red). Section 6.1 identifies fishing-related threats, 6.2 identifies non-fishing related threats. Section 7 provides management options to minimize impacts and Section 8 identifies research needs. The EFH amendment is updated every five years.

[1] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[2] GMFMC. *Amendment 13 to the Shrimp Fishery Management Plan. Gulf of Mexico Fishery Management Council*. 2005. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Shrimp%20Amend%2013%20Final%20805.pdf

[3] "Research" Sou*theast Fisheries Science Center, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/research_home/index.html

[4] "ELB FAQs" *NOAA Fisheries, Galveston Lab*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/ELB/FAQ/index.html

[5] "Fishery Observer Programs" *NOAA Fisheries, Galveston Lab.* Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#observer_program

[6] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[7] Scott-Denton, E., P. Cryer, M. Duffy, J. Gocke, M. Harrelson, D. Kinsella, J. Nance, J. Pulver, R. Smith, and J. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74:1-27. http://www.thefreelibrary.com/Characterization+of+the+U.S.+Gulf+of+Mexico+and+South+Atlantic...-a0323658377

[8] National Marine Fisheries Service. 2011.

[9] Scott Raborn, Benny Gallaway, and John Cole. *Descriptive Assessment of the Most Prevalent Finfish Species in the US Gulf of Mexico Paneaid Shrimp Fishery Bycatch*. LGL Ecological Research Associates, Inc. August 2014. https://drive.google.com/file/d/0B-yvNu3ojn4ZRmF1NEVWNnBMZzQ/view?pli=1

[10] NMFS. 2012. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/documents/fisheries_bo/southeastshrimpbiop_final.pdf

[11] *NOAA Office of Protected Resources*. Web. Accessed November 2015. http://www.nmfs.noaa.gov/pr/species/index.htm

[12] NMFS. 2014. Endangered Species Act section 7 consultation biological opinion: reinitiation of Endangered Species Act (ESA) Section 7 consultation on the continued implementation of the sea turtle conservation regulations under the ESA and the continued authorization of the Southeast U.S. shrimp fisheries in federal waters under the Magnuson-Stevens Fishery Management and Conservation Act. Consultation No. SER-2-13-1225. http://sero.nmfs.noaa.gov/protected_resources/sea_turtles/documents/shrimp_biological_opinion_2014.pdf

[13] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[14] "Essential Fish Habitat Amendments" *Gulf of Mexico Fishery Management Council*. Web. Accessed November. 2015. http://gulfcouncil.org/fishery_management_plans/essential_fish_habitat.php

12.10 (b) Is an attempt being made through research to minimize non-utilized catches?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Harvesting Systems Unit: The SEFSC Pascagoula Lab contains the Harvesting Systems Unit, which is a team of gear specialists and fishery biologists performing research into critical problems relating to commercial and recreational fishing gear to inform and improve fisheries resource management.[1] The Harvest Systems Unit is responsible for the development, evaluation, certification, and national and international technology transfer of TEDs for trawling gear. The Harvesting Systems Unit is also responsible for the development and assessment of BRDs to reduce finfish bycatch in shrimp trawls. Research on TEDs and BRDs for the shrimp fishery is ongoing with annual testing on new designs of these devices to improve efficiency in reducing bycatch and minimizing shrimp loss and studies are conducted both independently, and in		

collaboration with commercial shrimpers through cooperative research projects. There are currently several certified designs of both TEDs and BRDs approved by the NOAA.[2,3] <u>Observer Program:</u> NOAA Fisheries monitors bycatch reduction methods and shrimp trawl impacts through an onboard observer program.[4] The Shrimp Bycatch Reduction Device Evaluation Research is an observer program organized and conducted through the Galveston Laboratory. This project consists of onboard monitoring and scientific data analysis. The observer program collects data on bycatch quantity and species composition, and evaluates efficacy of TEDs and BRDs currently in use in the commercial fishery. The fishery observer program was established in 1987 (becoming mandatory in 2007) and has helped provide data for evaluating the economic impact of TEDs and BRDs on the shrimping industry. Several studies have also been funded through NOAA's Cooperative Research Fund (CRP) to evaluate BRDs in the shrimp trawl fishery including projects by the Gulf and South Atlantic Fisheries Foundation (GSAFF).[5]		

[1] "Harvesting Systems Unit" *NOAA Southeast Fisheries Science Center*. Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/harvesting_systems.htm

[2] "TED Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/ted/designs.htm

[3] "BRD Designs" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/labs/mississippi/brd/designs.htm

[4] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[5] Frank Helies and Judy Jamison (2009) "Reduction Rate, Species Composition, and Effort: Assessing Bycatch Within the Gulf of Mexico Shrimp Trawl Fishery." NOAA/NMFS Cooperative Agreement Number NA07NMF4330125 (#101) http://www.gulfsouthfoundation.org/uploads/reports/101_final4.pdf

12.10 (c) Is the biodiversity of ecosystems and the aquatic habitat being safeguarded?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
	There are two overarching considerations for the Louisiana shrimp fishery with regard to conservation of biodiversity of ecosystems: bycatch and bottom habitat impacts. Substantial progress has been made in minimizing impacts to biodiversity and the ecosystem by the Louisiana shrimp fishery; however, some areas for potential improvements remain. Refer to responses to 7.2.2 and 7.6.9(a) for full details on bycatch, discards, waste, gear selectivity, endangered and threatened species and habitat impacts.	

12.11 (a) Before the commercial introduction of a new type of gear, is a scientific evaluation of its impact on the fisheries and ecosystems where it will be used being undertaken?
Yes...[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Both state and federal agencies limit the type of gear used within the fishery and new gear types are researched and permitted on a case by case basis. Refer to 8.4.7 response full for details.		

12.11 (b) Is the effect of such gear introduction monitored? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: *Required Reporting:* 50 CFR 622.51 requires fisherman with a Gulf of Mexico Shrimp Permit to submit a Vessel and Gear Characterization Form annually when renewing their permits.[1] The forms allows NOAA to track gear usage and changes in gear type/use. *Observer Program:* NOAA Fisheries monitors bycatch reduction methods and shrimp trawl impacts through an onboard observer program.[2] The Shrimp Bycatch Reduction Device Evaluation Research is an observer program organized and conducted through the Galveston Laboratory. This project consists of onboard monitoring and scientific data analysis. The observer program collects data on bycatch quantity and species composition, and evaluates efficacy of TEDs and BRDs currently in use in the commercial fishery. *Resource surveys:* SEAMAP- Gulf of Mexico conducts resource surveys that are used to assess the shrimp populations through the Summer and Fall Shrimp/Groundfish Surveys.[3] These surveys provide valuable information not only on shrimp, but also on the common bycatch species typically found in shrimp trawls. Trends in abundance of all species caught in SEAMAP trawls are monitored, and data from these trawls are used in bycatch estimates by NOAA Fisheries. **Louisiana:** LDWF trip ticket data collection requires reporting of gear types and quantities with landing information allowing LDWF to monitor use of gear types in commercial harvest.[4] Combined with data from the fishery independent sampling program, LDWF is able to detect changing trends in coastal resources, associated species and habitats that may be affected by new harvest methods.[5] Any permits for experimental gear issued by LDWF under Louisiana Revised Statutes 56:571 are closely monitored as a requirement for permit use.[6]		

[1] 50 C.F.R. § 622.51 http://www.ecfr.gov/cgi-bin/text-idx?SID=c3f4a934de419ab9e1d3eaf7cefeab60&node=50:12.0.1.1.2.3.1.2&rgn=div8

[2] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

[3] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[4] LDWF. *Trip Ticket Procedures Manual*. August 2010. http://www.wlf.louisiana.gov/sites/default/files/pdf/page_licenses/32450-Trip%20Tickets/ttmanual10_august2010.pdf

[5] LDWF. "Description of Fisheries Independent Sampling Activities. Marine Fisheries Section Core Sampling Programs. June 2015"

[6] La. R.S. 56:571 https://legis.la.gov/Legis/Law.aspx?d=105397

12.12 Are traditional fisheries knowledge and technologies being investigated and documented, in particular those applied to small-scale fisheries, in order to assess their application to sustainable fisheries conservation, management and development? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
An extensive history of the development of the shrimp fishery has been investigated and documented in the GMFMC Shrimp FMP. This FMP has been updated several times and each amendment contains updated information of socio-cultural aspects of the fishery.[1] The Louisiana Shrimp FMP provides a list of references to previous sources that have documented the history of the Louisiana shrimp fishery.[2] The current Louisiana Shrimp FMP contains a description of fishery based on recent data from the LDWF Socioeconomic Research and Development Section.		

[1] "Shrimp Management Plans" *Gulf of Mexico Fishery Management Council.* Web. Accessed November 2015. http://www.gulfcouncil.org/fishery_management_plans/shrimp_management.php

[2] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. Page 16. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

12.13 (a) Is the use of research results as a basis for the setting of management objectives, reference points and performance criteria being promoted? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
<u>Federal</u>: The GMFMC manages the Gulf of Mexico shrimp fishery under the principles of the MSA. The MSA (first enacted in 1976, and amended in 1996 and 2006) is the primary law governing fisheries management in the U.S.[1] The MSA established eight regional councils with the primary responsibility of developing fishery management plans (FMPs) that comply with 10 National Standards designed to promote sustainable fisheries management. National Standard 1 (NS1) requires "*Conservation and management measures shall prevent*		

overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry."[2] Current guidelines for NS1 require specification of MSY and OY, based on the best scientific evidence available, for each fishery managed by the regional councils. NS1 requires specification of SDC so that overfishing and overfished determinations can be made for stocks in the fishery. National Standard 2 (NS2) requires that "*Conservation and management measures shall be based upon the best scientific information available."* [3] The MSA, section 302(g)(1)(A) requires each regional management council to form a SSC to serve as the council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[4] The SSC typically includes economists, biologists, sociologists and natural resource attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf states. The SSC establishes research priorities based on management needs and submits these to NOAA SEFSC.[5] Research is then carried out by SEFSC's various labs and research programs across the Gulf o meet these needs.[6] **<u>Louisiana:</u>** LDWF conducts scientific monitoring and research directly in support of management and conservation decisions. With respect to the shrimp fishery, LDWF monitors shrimp populations and fishing activity through the fishery independent monitoring program and the trip ticket program. LDWF manages the shrimp fishery through seasonal closures to ensure that enough mature shrimp survive to reproduce and to allow for shrimp to grow to marketable size prior to harvest.[7] Louisiana typically has three shrimp seasons – a spring inshore season from May through July targeting mainly brown shrimp, a fall inshore shrimp season from August to December mainly targeting white shrimp, and a season for outside waters that may remain open year-round or have a winter closure to protect overwintering white shrimp. Seasons are flexible and are set by LWFC based on biological and environmental data from fishery-independent sampling.		

[1] The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 - 1891(d)) http://www.mmc.gov/legislation/pdf/msf_cm_act.pdf

[2] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[3] "National Standards Guidelines" *NOAA Fisheries*. Web. Accessed November 2015. http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/index.html

[4] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[5] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[6] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[7] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

12.13 (b) Is research being used to help ensure adequate linkages between applied research and fisheries management? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
Federal: GMFMC has a SSC to serve as the Council's scientific and technical advisory body, which assists with development, collection, evaluation, and peer review of biological, statistical, economic, social, and other scientific information. Each SSC provides "ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, MSY, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices."[1] The SSC typically includes economists, biologists, sociologists and natural resource attorneys who are knowledgeable about the technical aspects of Gulf fisheries. In addition to the primary Standing SSC for the GMFMC, there is also a Special Shrimp SSC, which includes a representative from each of the five Gulf states. The SSC establishes research priorities based on management needs and submits these to NOAA SEFSC.[2] Research is then carried out by SEFSC's various labs and research programs across the Gulf to meet these needs.[3] **Louisiana:** LDWF organizational structure is designed to develop management strategies, determine research needs, conduct research based on those needs, utilize the results of research in management decisions, and ensure enforcement of adopted regulations.[4] LWFC and LDWF are mandated to conduct the necessary research to properly manage the fisheries of Louisiana by the Louisiana Revised Statutes, Title 56.[5] Academic institutions and non-government organizations are also often utilized for applied research on coastal or fisheries issues. LDWF scientists participate in applied research for regional organizations, including GSMFC and GMFMC.		

[1] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[2] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[3] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[4] Marty Bourgeois, Lisa Landry, Julia Lightner, Jeff Marx and Katie Semon. *Louisiana Shrimp Fishery Management Plan*. LDWF, Office of Fisheries, updated July 27, 2015. http://www.wlf.louisiana.gov/sites/default/files/pdf/page/37762-fishery-management-plans-marine/shrimpfmp7-27-15.pdf

[5] La. R.S. 56 http://www.wlf.louisiana.gov/sites/default/files/pdf/page/34690-title-56/2010title56complete.pdf

12.14 Are States conducting scientific research activities in waters under the jurisdiction of another State, ensuring that their vessels comply with the laws and regulations of that State and international law? **Yes...**[1] **No...**[0]

Extent of compliance
N/A (not included in scoring)
NOAA does not conduct scientific research in waters under the jurisdiction of another country. Louisiana does not conduct scientific research in waters under the jurisdiction of another state.

12.17 Are States, either directly or with the support of relevant national organizations, developing collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks? **Yes...**[1] **Some...**[½] **No...**[0]

Extent of compliance		
Yes	**Some**	**No**
The GMFMC is one of the regional Fishery Management Councils established by the Fishery Conservation and Management Act of 1976.[1] The GMFMC is a collaboration between NOAA Fisheries and the five Gulf state marine resource management agencies with additional representation from the USCG, USFWS, Department of State, and GSMFC. The GMFMC maintains a SSC responsible for providing scientific advice to the GMFMC.[2] The SSC is responsible for advising GMFMC on the adequacy of scientific information and analyses for proposed management measures and alternatives. The SSC establishes research priorities based on management needs and submits these to NOAA SEFSC.[3] Research is then carried out either by NOAA Fisheries SEFSC's various labs and research programs across the Gulf or through collaboration with each of the five Gulf state resource management agencies.[4] Additionally, GSMFC provides technical and research programs through collaboration between the U.S. Gulf States to support fisheries management.[5] The SEAMAP and Economic Data programs each provide research support to shrimp fishery management in the Gulf of Mexico.[6,7] GSMFC maintains a Technical Coordinating TCC, which provides technical and scientific advice to the commission and reviews reports and actions by other committees and programs. <u>International:</u> There is a shrimp fishery prosecuted in Mexican waters in the Gulf of Mexico that harvests the same species (*Farfantepenaeus aztecus* and *Litopenaeus setiferus*) as the U.S. Gulf of Mexico shrimp fleet, but no formal management body exists across international boundaries. The U.S. and Mexico do collaborate on fishery management issues through the United States-Mexico Fisheries Cooperation		

Program, which is a bilateral consultative agreement that was informally agreed upon by the U.S NMFS and SAGARPA in 1983.[8] Three MOU have been formalized through this relationship including the MEXUS-Golfo research program. FCTs between NMFS and CONAPESCA occur annually and MEXUS-Golfo working groups are held as needed. Recent FCT meetings have included discussion of sustainable fisheries management, protection and conservation of species such as sea turtles, enforcement cooperation, aquaculture, collaborative research and participation in fisheries related international organizations.[9] For the purposes of management and assessments of shrimp, no detailed information is available for shrimp caught and and/or landed in Mexico; therefore, the Gulf of Mexico shrimp stocks are considered from the Mexican border to Florida and assessed accordingly. The SEFSC Galveston Lab shrimp research program includes an Information Transfer for Shrimp Fisheries' project. This project includes communications with Mexico Fishery Laboratories to enhance data collection and promote global stewardship of resources.[10]		

[1] *Gulf of Mexico Fishery Management Council*. Web. Accessed November 2015. http://gulfcouncil.org/about/index.php

[2] 50 C.F.R. § 600.133 Scientific and Statistical Committee (SSC) http://www.ecfr.gov/cgi-bin/text-idx?SID=a85fa5586a3b7f4f03ddb01c0411a72c&mc=true&node=se50.12.600_1133&rgn=div8

[3] GMFMC. *Gulf of Mexico Fishery Management Council Updated List of Fishery Monitoring and Research Priorities for 2015-2019*. Gulf of Mexico Fishery Management Council. http://www.gulfcouncil.org/resources/SEDAR/GMFMC%20Updated%20List%20of%20Fishery%20Research%20and%20Monitoring%20Priorities%202015-2019.pdf

[4] "Research and Data" *NOAA Southeast Fisheries Science Center.* Web. Accessed November 2015. http://www.sefsc.noaa.gov/research/

[5] *Gulf States Marine Fishery Commission*. Web. Accessed November 2015. http://www.gsmfc.org/

[6] "Southeast Area Monitoring and Assessment Program (SEAMAP)" *Gulf States Marine Fisheries Commission.* Web. Accessed November 2015. http://www.gsmfc.org/seamap.php

[7] "Publications: Fisheries Economic Data Program" *Gulf States Marine Fisheries Commission*. Web. Accessed November 2015. http://www.gsmfc.org/pubs.php?s=ECON

[8] Secretaria de Agricultura, Ganaderia, Desaorrollo rural, Pesca y Alimentacion (SAGARPA), 2012. Diario Oficial, Segunda sección, 24 de agosto de 2012. Actualización de la Carta Nacional Pesquera, 236 pp. http://www.inapesca.gob.mx/portal/documentos/publicaciones/CARTA%20NACIONAL%20PESQUERA/24082012%20SAGARPA.pdf

[9] NOAA. 2014. *International Agreements Concerning Living Marine Resources of Interest to NOAA Fisheries.* http://www.nmfs.noaa.gov/ia/intlagree/docs/2012/international_agreements.pdf

[10] "Galveston Laboratory" *NOAA Fisheries*. Web. Accessed November 2015. http://www.galvestonlab.sefsc.noaa.gov/research/fishery_management/index.html#shrimp_program

APPENDIX A: RECOMMENDATIONS PROVIDED BY GLOBAL TRUST CERTIFICATION LTD (GTC)

Taken from the MARINE ADVANCEMENT PLAN (MAP) VERIFICATION REPORT for the Louisiana Shrimp Fishery:

GTC Ltd has been contracted by Audubon Nature Institute, as an independent assessment body, competent in objective fishery evaluation to provide third-party verification of reports compiled by Gulf United for Lasting Fisheries (G.U.L.F.) for the development of Fishery Marine Advancement Plans (MAPs) in the US Gulf Of Mexico.

The Marine Advancement Plan (MAP) Verification Report provides a detailed evaluation of the Sustainability Benchmarking Report for the **Louisiana Shrimp Trap Fishery**, an assessment against FAO criteria according to FAO Circular 917 (Caddy Checklist, 1996) and a draft action plan of recommendations which can form the basis of the MAP for the fishery. The Report confirms any existing gaps (weaker scores) identified in the Sustainability Benchmark Report and identifies any additional areas where the GTC evaluation team considers that further gaps are present.

The following provides a summary of the issues under evaluation for each AMBER or RED rated clause and makes recommendations on the advancement activities that will support closing the gap or resolving the identified issue.

Fishery Recommendations: "No"-rated (RED-scoring) clauses

No clauses have been scored with a "No" (RED) rating

Fishery Recommendations: "Some"-rated (AMBER-scoring) clauses

RECOMMENDATION 1: Define and control capacity
Clauses: **7.1.8 (a)(b) – Have mechanisms been established to (identify, quantify) prevent or eliminate excess fishing capacity? Have these measures proved effective?** **7.2.2 (a)(i) and (ii) – Is the level of excess capacity defined? Avoided?** **7.6.1 – Is the level of fishing permitted commensurate with the current state of the fishery resources?**
Summary: At Federal level, an analysis of the Gulf of Mexico shrimp fishery to determine the level of overcapacity and costs associated with reducing overcapacity within the fleet was carried out. The fishery was broken down into subgroups; capacity was determined for each division and then extrapolated to estimate total fleet level activity. Amendment 13 of the Gulf of Mexico Shrimp FMP established a 10-year moratorium on the issuance of commercial shrimp vessel permits capping the number of vessels in the federal fishery. The 10-year moratorium put in place by Amendment 13 expires in December of 2016 and the GMFMC is currently in discussions on the development of Amendment 17 to determine if the moratorium will expire, be extended, or development of a limited-access system will be put in place. At the State level, there is currently no limit on the fishing capacity for the shrimp fishery. The

Louisiana Shrimp FMP notes that it is difficult to quantify the exact number of fishermen participating in the commercial shrimp fishery because gear licenses are transferrable. LDWF estimates based on gear licenses indicate that in 2000 and 2001, approximately 10,000 commercial fishermen held shrimp gear licenses. This number steadily declined to a low of approximately 5,600 licensed shrimpers in 2008. Trip ticket reports indicate that about 7,000 harvesters reported shrimp sales in 2001, then number of harvesters reporting shrimp sales declined to a low of 2,912 in 2008.

Recommended Action:

At the State level:

There is an important difference in the number of fishermen participating in the commercial shrimp fishery obtained from gear licenses and trip tickets. Therefore, it is recommended that a mechanism should be implemented in order to obtain an accurate number of fishermen participating in commercial shrimp fishing.

The following are also recommended:

- An optimal or target capacity should be defined
- Mechanisms to limit fishing effort should be implemented such a capping the number of licenses.

RECOMMENDATION 2: Conservation of biodiversity and aquatic habitat

Clauses:

7.2.2 (d) – Has the biodiversity of aquatic ecosystems been conserved (as a result of operation of the fishery in question)?

12.10 (c) Is the biodiversity of ecosystems and the aquatic habitat being safeguarded?

Summary:

The primary gear types in the Louisiana commercial shrimp fishery are otter trawls, skimmer trawls, and butterfly nets. Bycatch is a major concern in shrimp fisheries and there is much controversy among stakeholders on the potential impacts of shrimp trawling on the ecosystem. Managers and fishermen throughout the Gulf of Mexico have cooperated to utilize best-practices for bycatch reduction and continue to collaborate on innovative methods to further reduce bycatch; however, the shrimp industry continues to draw criticism by some due to the continued mortality of some bycatch species.

Recommendations:

- Increase compliance with tow time regulations for shrimpers not using TEDs in skimmers
- Maintain high TEDs compliance rates on otter trawls
- The observer coverage for both Federal and State entire shrimp fishing fleet should be increased to increase the documentation on bycatch, and the effectiveness of BRDs, TEDs, and tow-time regulations.
- BRDs should be mandatory in State waters.

RECOMMENDATION 3: Reduce environmental impacts from human activities

Clauses:

7.2.2 (f) – Environmental impacts: Have adverse environmental impacts on the stocks from human activities been assessed and, where appropriate, rectified?

Summary:

A network of Federal and State agencies as well as numerous NGOs assesses and addresses the human impacts on marine and coastal environments and natural resources both in Louisiana and across the Gulf region. However there are many impacts which are still under assessment and have not been fully rectified – for example, the 2010 Deepwater Horizon oil spill, and the ongoing wetlands loss and pollution caused by coastal population increases.

The Louisiana Shrimp FMP identifies three main ongoing issues: Habitat Loss, Hypoxia, and Coastal Restoration, Flood Control, and Freshwater Diversion Projects.

Recommendations:

1. The advice of the network of agencies assessing the human impacts on marine and coastal environments and natural resources should be implemented and all the current research efforts supported.
2. The recommended options presented in the Louisiana Shrimp FMP Current Issues and Management Options Section should be implemented.

RECOMMENDATION 4: Reduce waste, discards and catch of non-target species

Clauses:

7.6.9 (a) Are appropriate measures being applied to minimize:

(i) - waste and discards?

(ii) - catch of non-target species (both fish and non-fish species)?

(iii) - impacts on associated, dependent or endangered species?

7.6.9 (b) Are suitable arrangements in place to promote, to the extent practicable, the development and use of selective, environmentally safe and cost-effective gear and techniques?

Summary:

Several regulations have been designed to minimize waste and discards, catch of non-target species, and impacts on associated, dependent or endangered species. However, observer coverage indicates that 60% of tows throughout the 3 years of study have exceeded tow time limits, and low compliance with tow time regulations has raised much criticism from some stakeholders; and Louisiana does not required BRDs in state waters.

Recommendations:

1. Increase compliance with tow time for shrimpers not using TEDs in skimmers
2. The observer coverage for both Federal and State entire shrimp fishing fleet should be increased to increase the documentation on bycatch, and the effectiveness of BRDs, TEDs, and tow-time regulations.
3. BRDs should be mandatory in State waters.

RECOMMENDATION 5: Maintain records of crew members and qualifications

Clauses:

8.1.8: Are records of fishers being maintained which should, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws?

Summary:

At Federal level, for vessels of 20 gross tons or more, the master of the vessel must have a written agreement with each crewmember on the terms of employment as a crewmember. Crewmembers must be U.S. citizens, or aliens with legal documentation to work in the U.S. The Captain (Master or individual in charge of the vessel) must be a U.S. citizen.

At the State level, LDWF maintains records of license holders, but no documentation is required for additional crew members. There are no requirements based on competency for entry into the fishery, and no records on competency are maintained.

Recommendations:

1. The score of this section could be improved with the introduction of record-keeping of crew

members other than license holders at the State level.

RECOMMENDATION 6: Suspension of officers/masters licenses charged with fishing-related offense

Clauses:

8.1.9 Do measures applicable in respect of masters and other officers charged with an offence relating to the operation of fishing vessels include provisions which may permit, *inter alia*, refusal, withdrawal or suspension of authorizations to serve as masters or officers of a fishing vessel?

Summary:

At Federal level, there are no provisions which may permit the refusal or suspension of authorizations to serve as masters or officers of a fishing vessel as a means to enforce federal regulations. However, permits attached to the fishing vessel itself can be suspended or revoked, as explained in 7.7.2 (c).

Recommendations:

1. The score of this section could improve with the introduction in the Federal regulations of the refusal or suspension of authorizations to serve as masters or officers of a fishing vessel as a means to enforce regulations.

RECOMMENDATION 7: Documentation of non-fish catches

Clauses:

8.4.3 (a)(ii) Is documentation required with regard to fishing operations, retained catch of fish and non-fish species and, as regards discards, the information required for stock assessment as decided by relevant management bodies, collected and forwarded systematically to those bodies?

- documentation on non-fish catches

(Note: Clause 8.4.3(a) is broken down into 3 scoring responses but the below recommendation is specific to non-fish species, and does not include documentation on retained catch of fish species.)

Summary:

NOAA Fisheries does not require the direct reporting of non-fish species; however, reporting of interactions with some species is required by the Office of Protected Species. In addition, there is currently no reporting requirement for capture of non-fish species in Louisiana.

Recommendations:

1. Development and implementation of a non-fish catches monitoring system at both Federal and State level. Non-fish catch data shall be returned to the management bodies for analysis.

RECOMMENDATION 8: Observer coverage

Clauses:

8.4.3 (b) Is such an observer and inspection scheme being established in order to promote compliance with applicable (fishery management) measures?

Summary:

The most recent report from the Observer Program, published in 2012, indicates that observer coverage is now at about 2% for the Gulf and South Atlantic shrimp fisheries due to decreases in effort in the fishery. Observer coverage through this program only applies to the offshore fleet with federal permits and does not cover inshore state-licensed shrimp trawls. Amendment 13 notes that 5% coverage is typical of standard observer programs; however, the expense of outfitting the Gulf and South Atlantic shrimp fleet at 5% coverage is too cost prohibitive, and given the current economic condition of the fishery, the industry could not be asked to incur the cost. In 2012, observer coverage was added specifically for the inshore skimmer trawl fishery in the northern Gulf of Mexico due to increased sea turtle stranding reports. In 2014, of the 277 permit holders selected for the program, only

15 vessels carried observers.

Recommendations:

1. The rating in this section should improve over time with the increase of the observer coverage for both Federal and State entire shrimp fishing fleet.

RECOMMENDATION 9: Gear selectivity

Clauses:

7.2.2 (g)(iii) - Have selective and environmentally-safe and cost-effective fishing methods been developed?

8.5.1 (a) Where practicable, is there a requirement that fishing gear, methods and practices are sufficiently selective as to minimize waste, discards, catch of non-target species - both fish and non-fish species - and impacts on associated or dependent species and that the intent of related regulations is not circumvented by technical devices and that information on new developments and requirements is made available to all fishers?

Summary:

The primary gear types in the Louisiana commercial shrimp fishery are otter trawls, skimmer trawls and butterfly nets. Bycatch is a major concern in shrimp fisheries and there is much controversy among stakeholders on the potential impacts of shrimp trawling on the ecosystem. Managers and fishermen throughout the Gulf of Mexico have cooperated to utilize best-practices for bycatch reduction and continue to collaborate on innovative methods to further reduce bycatch; however, the shrimp industry continues to draw criticism by some due to the continued mortality of some bycatch species.

Recommendations:

1. Increase compliance with tow time regulations for shrimpers not using TEDs in skimmers
2. Maintain high TEDs compliance rates on otter trawls
3. The observer coverage for both Federal and State entire shrimp fishing fleet should be increased to increase the documentation on bycatch, and the effectiveness of BRDs, TEDs, and tow-time regulations.
4. BRDs should be mandatory in State waters.